SAN FRANCISCO WASTEWATER MANAGEMENT

REDESIGN PLAN FOR THE GREAT HIGHWAY

PREPARED FOR THE

SAN FRANCISCO WASTEWATER MANAGEMENT PROGRAM

BY

MICHAEL PAINTER & ASSOCIATES
&
TUDOR ENGINEERING COMPANY

SEPTEMBER 1977

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City and County of San Francisco
WASTEWATER MANAGEMENT

September 3, 1977

To All Interested San Francisco Residents and Organizations:

Attached is the final report by Michael Painter and Associates, outlining the concept developed over the last six months for restoring the Great Highway-Ocean Beach area in conjunction with the construction of the West Side Transport portion of the City's Wastewater Program.

Michael Painter's concept development is consistent with the City's planning mandates and the Board of Supervisors' resolutions, some of which date back for seven years. In the course of developing this concept, various City Departments; including Recreation and Parks, Planning, the Department of Public Works, and other governmental agencies, including the Golden Gate National Recreation Area, Coastal Commission, State Water Resources Control Board, and the Federal Environmental Protection Agency; have participated. Further, as outlined in the report, public participation in the concept development has been extensive and intensive.

San Francisco has an opportunity to transform the Great Highway and Ocean Beach area into an exciting and attractive recreation area. The concept will receive a public hearing before the Recreation and Parks Commission, City Planning Commission, and the Director of Public Works. The hearing will be held SEPTEMBER 15, 1977, AT 12:30 P.M. IN THE HALL OF FLOWERS IN THE GOLDEN GATE PARK. This hearing will be the first step in the concept approval process.

Following concept approval we will initiate the design process. We welcome your participation in the public hearing or you can submit written comments on the concept as developed by Michael Painter and Associates.

Yours very truly,

RICHARD SKLAR
Program Coordinator

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I. INTRODUCTION

As part of the San Francisco Wastewater Management Program, the City and County of San Francisco plans to install a large transport-storage sewer line under the Upper Great Highway from Fulton Street to a point about 200 feet south of Sloat Boulevard. Because construction of the proposed consolidation sewer would remove or damage most of the Upper Great Highway, part of this project includes reconstruction of the roadway. The necessity for the reconstruction of the area provides an opportunity for the redesign of the Upper Great Highway in a manner which better meets the objectives and policies of the Comprehensive Plan for the City and County of San Francisco, which calls for the development of a parklike, recreational road bordering the ocean.

This study has been prepared for the Wastewater Management Program by a consultant team consisting of Michael Painter & Associates in association with Tudor Engineering Company and consultants William Van Peeters, Chin & Hensolt and Wilson & Associates. During the planning process regular inter-agency meetings were held with the San Francisco Departments of City Planning, Public Works and Recreation and Parks and including representatives of the Golden Gate National Recreation Area and the California Coastal Commission which also have jurisdiction over the Ocean Beach corridor. A series of public meetings were also held to inform citizens of the project and gain community input.

The study area included the Upper Great Highway from Sutro Heights Park on the north to Skyline Boulevard on the south. It also included all land from the Pacific Ocean east to the Lower Great Highway. The cost of the restoration and redesign of the Upper Great Highway between Fulton and the new sewage treatment plant, which will be located 1000 feet south of Sloat Boulevard, as well as the dune and beach areas to the west of it would be borne as follows: 75% by the U.S. Environmental Protection Agency, 12 1/2% by the State of California and 12 1/2% by San Francisco. No funding is currently allocated for the recommended improvements to the Lower Great Highway, for that portion of the study area to the north of Fulton Street or for the area to the south of the new sewage treatment plant.

There was broad agreement that the Upper Great Highway area as it presently exists is not functioning satisfactorily and should not be replaced in its present form. The natural dune system which once bordered the area prior to the development of the Sunset District was completely destroyed when the present Upper Great Highway was installed in 1927 on an artificially high sand fill without adequate shoreline and landscape protection. Four of the eight lanes of pavement are not required for traffic and part of this unused section is covered with sand. The remaining four lanes are periodically blocked with sand; during the first six months of 1977 the roadway was closed to traffic

for 70 days. Excess sand has built up on the shoulders of the roadway blocking many views of the ocean formerly afforded to residences along the Lower Great Highway. Blowing sand is also a severe problem to the Ocean Beach community. In addition, at some points the existing roadway is threatened by ocean action where the fill has been eroded to within a few feet of the roadbed. Beach access is also inadequate, unattractive and unsafe, discouraging many from regularly using the portion of the ocean opposite the Sunset District and causing others to risk crossing the highway at random.

The alternative concept plans developed as part of this study attempt to address all of these problems. They expand and further develop ideas shown on the existing City Plan and further explore alternatives not covered by city policy.

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TABLE OF CONTENTS

PAGE

PROJECT STAFF i.
CONTRIBUTING AGENCIES AND DEPARTMENTS ii.
I. INTRODUCTION iii.
II. THE DESIGN PLAN 1.
- A. Sloat Boulevard to Lincoln Way 1.
  - 1. Beach Restoration 1.
  - 2. Dune Restoration and Planting 1.
  - 3. Recreational Corridor 3.
  - 4. Roadway 5.
  - 5. Pedestrian Beach Access 6.
  - 6. Parking 9.
  - 7. Public Transit 10.
  - 8. East Park 10.
  - 9. Lower Great Highway 10.
- B. Lincoln Way to Fulton Street 11.
- C. Fulton Street to Sutro Heights Park 11.
- D. Sloat Boulevard to Skyline Boulevard 14.

III. IMPACT ON VEHICULAR TRAFFIC AND PARKING 16.
- A. Vehicular Traffic 16.
- B. Parking 21.

IV. RESPONSE TO GOVERNMENTAL POLICIES 23.
- A. Comprehensive Plan of the City and County of San Francisco 23.
- B. California Coastal Commission 27.
- C. Golden Gate National Recreation Area 30.

V. PUBLIC PARTICIPATION 31.
- A. Information and Involvement Program 31.
- B. Response to Needs and Desires of General Public 32.

VI. CONSTRUCTION COST ANALYSIS 33.
VII. MAINTENANCE REQUIREMENTS AND COST ANALYSIS 34.
VIII. RECOMMENDATIONS FOR REVIEW AND APPROVAL 35.

FIGURES

1. PROPOSED BEACH PROFILE 2.
2. PARTIAL PLANS OF PARK ROAD AND RECREATIONAL CORRIDOR 4.
3. DESIGN PLAN - SLOAT BOULEVARD TO LINCOLN WAY 7.
4. DESIGN PLAN - LINCOLN WAY TO FULTON STREET 12.
5. FULTON STREET TO SUTRO HEIGHTS PARK 13.
6. SLOAT BOULEVARD TO SKYLINE BOULEVARD 15.
7. LOCAL ACCESS - SCHEMES 1 AND 2 18.
8. LOCAL ACCESS - SCHEME 3 20.

TABLES

A. SUMMARY OF PARKING SERVING OCEAN BEACH ON PUBLIC LAND 39.
B. RECOMMENDED PLANT MATERIALS FOR DUNE AREAS 40.

II. THE DESIGN PLAN

As a result of this study, a single concept plan was developed for the treatment of the beach and dune areas along Ocean Beach and three alternative plans were developed for the roadway. The study was primarily focused on the area between Fulton Street and Sloat Boulevard since that is where the main sewer line will be installed. It did, however, consider the entire corridor between Sutro Heights Park and Skyline Boulevard.

The description of the design plan breaks the corridor into four parts. The first part described extends from Sloat Boulevard to Lincoln Way. The following design elements are individually treated in the description: 1) beach restoration, 2) dune restoration and planting, 3) recreational corridor, 4) park road, 5) pedestrian beach access, 6) parking, 7) public transit, 8) East Park and 9) Lower Great Highway. The second part proposes a connection between Golden Gate Park and Ocean Beach in the area between Lincoln Way and Fulton Street; the third part proposes changes to the area between Fulton Street and Sutro Heights Park; and the fourth part described extends from Sloat Boulevard to Skyline Boulevard.

The most important change being recommended is the lowering of the profile of the existing Upper Great Highway and beach. Sand generated from excavation for the consolidation sewer and from the lowering of the profile would be used to extend Ocean Beach out approximately 200 feet further to the west and to develop a lower, wider, multiple-ridge system as shown in Figure 1.

A. SLOAT BOULEVARD TO LINCOLN WAY

1. BEACH RESTORATION

Approximately 48 acres of recreation area would be added to Ocean Beach as a result of the lowering of the Upper Great Highway and the extension of the beach to the west, as illustrated in Figure 2. The southern portion of the consolidation sewer will generate comparatively greater quantities of sand, corresponding to the greater need for fill along the southern portions of Ocean Beach, where erosion has been the most severe.

In coordination with the Wastewater Management Program's proposed changes to the dune profile, the San Francisco District of the U.S. Army Corps of Engineers is developing a separately funded beach stabilization program for the Golden Gate National Recreation Area, in order to reduce seasonal beach movement and protect the expanded beach area.

2. DUNE RESTORATION AND PLANTING

The existing dunes have high points varying between elevations 25 and 32, according to City Datum[1] and slope steeply to the beach. Prevailing northwesterly winds sweep dry sand off of the beach and up

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[1] Elevation 0.00 in San Francisco Datum is 8.6' above mean sea level. All elevations used in this report are City Datum.

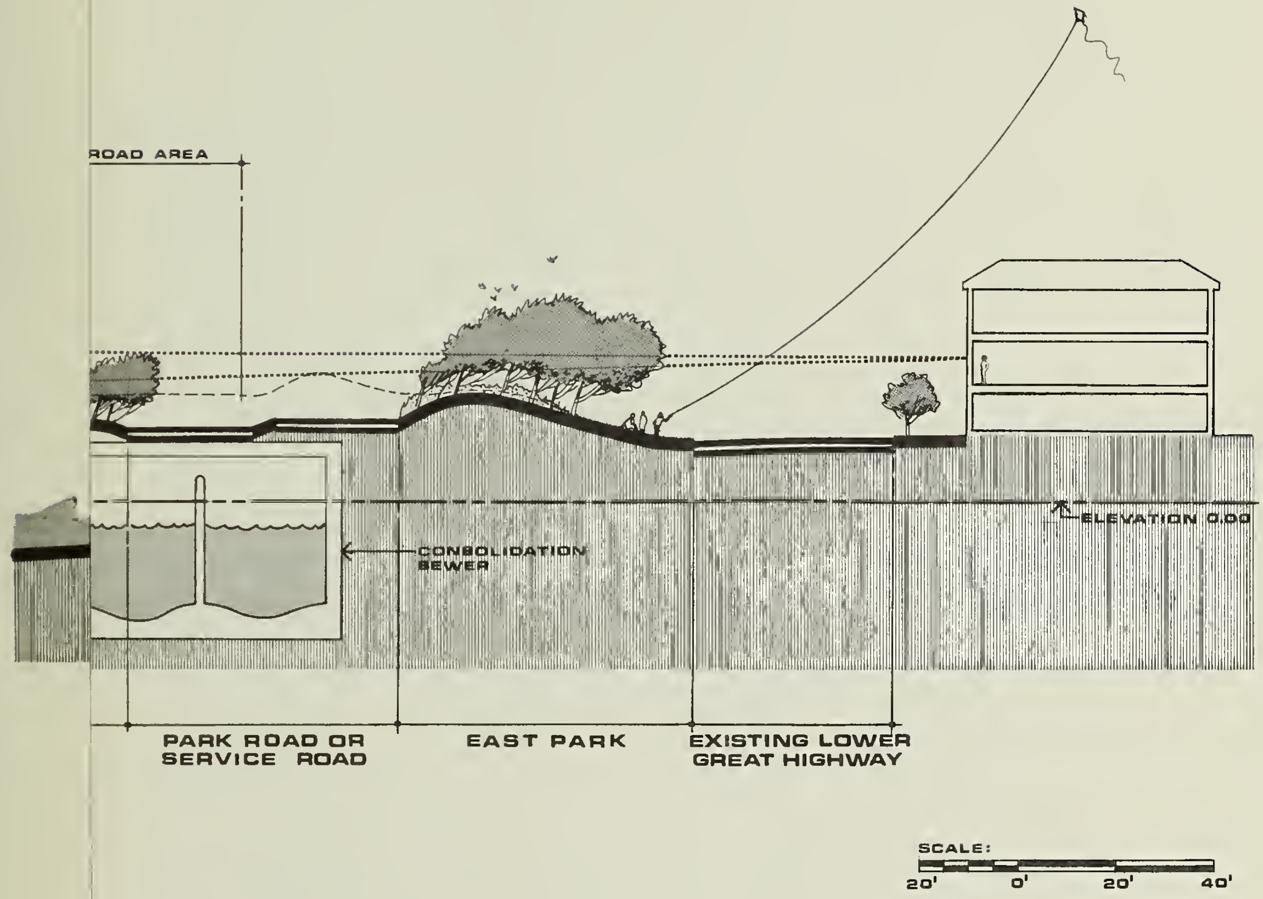
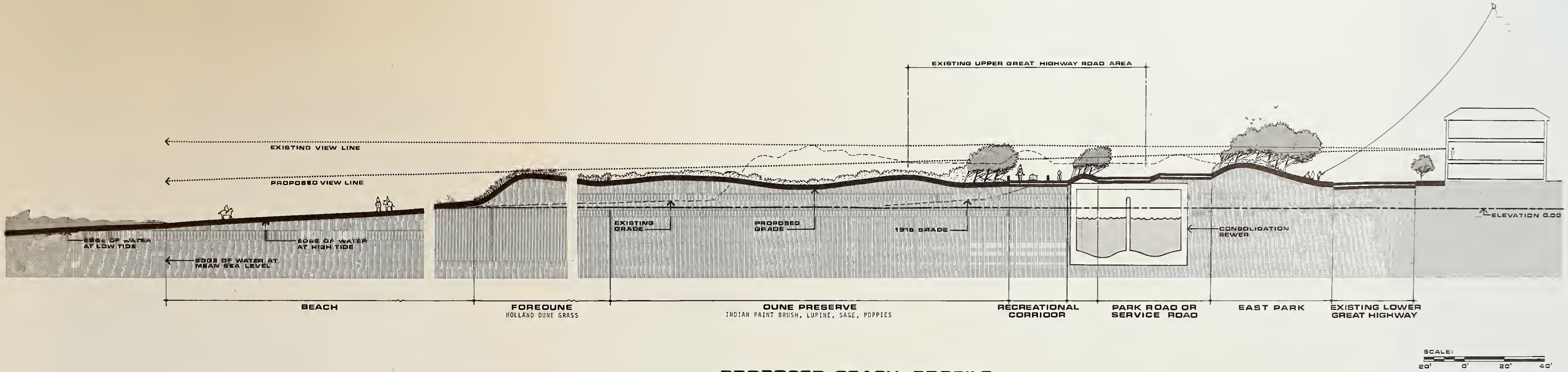

ROAD AREA
CONSOLIDATION SEWER
ELEVATION 0.00
PARK ROAD OR SERVICE ROAD
EAST PARK
EXISTING LOWER GREAT HIGHWAY
SCALE:
20'
0'
20'
40'

FIGURE 1


EXISTING UPPER GREAT HIGHWAY ROAD AREA
EXISTING VIEW LINE
PROPOSED VIEW LINE
EDGE OF WATER AT LOW TIDE
EDGE OF WATER AT HIGH TIDE
EDGE OF WATER AT MEAN SEA LEVEL
EXISTING GRADE
PROPOSED GRADE
1918 GRADE
CONSOLIDATION SEWER
ELEVATION 0.00
BEACH
FOREDUNE
HOLLAND DUNE GRASS
DUNE PRESERVE
INDIAN PAINT BRUSH, LUPINE, SAGE, POPPIES
RECREATIONAL CORRIDOR
PARK ROAD OR SERVICE ROAD
EAST PARK
EXISTING LOWER GREAT HIGHWAY
SCALE:
20'
0'
20'
40'

PROPOSED BEACH PROFILE

FIGURE 1

exposed portions of the highway escarpment. The sand is deposited in drifts wherever the wind velocity is reduced. A sparse mantle of vegetation, consisting notably of ice plant (Mesembryanthium edule), sea rocket (Cakile maritima), holland dune grass (Ammophila arenaria) and beach bur (Franseria chamissonis) covers less than 40% of the drifts.

The existing single ridge dune profile is proposed to be regraded to establish a lower, wider, multiple-ridge dune system as shown in Figure 1. The dune area would be expanded from an existing average of 100 feet to a width of 290 feet. The lower height and wider profile would create a more gentle slope to the beach, varying from 3:1 to 2.5:1.

Landscaping with irrigation is an integral part of stabilizing the proposed profile. The slope and ridge closest to the ocean, called the foredune, would be planted with holland dune grass to retain the sand in place and to trap fresh blown sand from the beach.

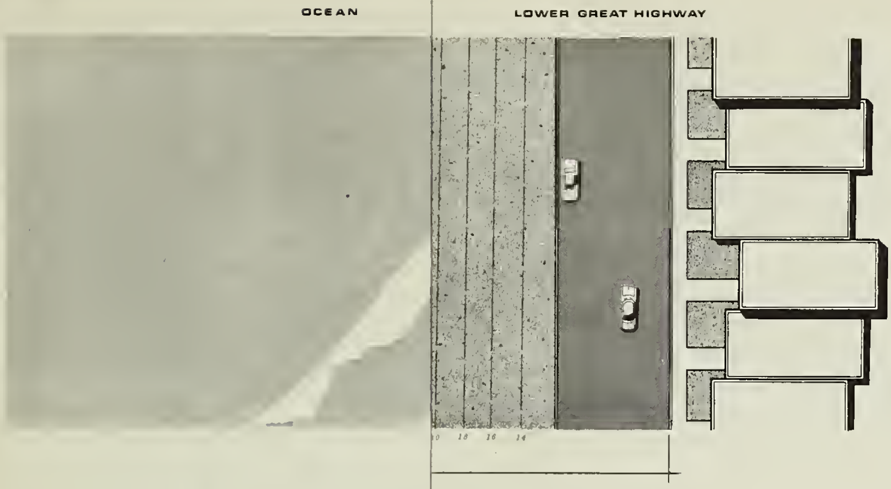
In the wind shadow of the foredune ridge, colorful native California dune plantings could flourish including varieties of lupine, poppies, sand verbena, indian paint brush, dwarf coyote bush, lizard tail and endangered species such as the dune tansy and wallflower. All of these species now exist in similar exposures at Fort Funston, Sutro Heights Park and the Presidio. Irrigation would encourage quick growth.

The dunes would be a densely planted, landscaped area wide enough to absorb wind-blown sand from the beach, reducing blowing sand in the adjacent residential areas. The plantings would have to be protected from pedestrian encroachment as they cannot withstand this kind of abuse. Pedestrians and equestrians would be encouraged to stay on designated trails by signing and 3' high concrete bollards connected with chain or cable.

This summer an experimental sand management program has been initiated by the Golden Gate National Recreation Area and the City and County of San Francisco on a 500 foot section of beach near Pacheco Street. It is expected that this program will develop additional information on the feasibility and characteristics of various sand dune plants used to control blowing sand and will produce sand dune plants for later harvest and use.

3. RECREATIONAL CORRIDOR

Linear trails for equestrians, pedestrians and bicyclists would be located adjacent to the restored dunes extending the full length of Ocean Beach between the reconstructed roadway and the beach, connecting with trails in Golden Gate Park and in other parts of the Golden Gate National Recreation Area. Trails would be closely spaced to retain the maximum amount of undisturbed landscaped dune area and to minimize maintenance costs.



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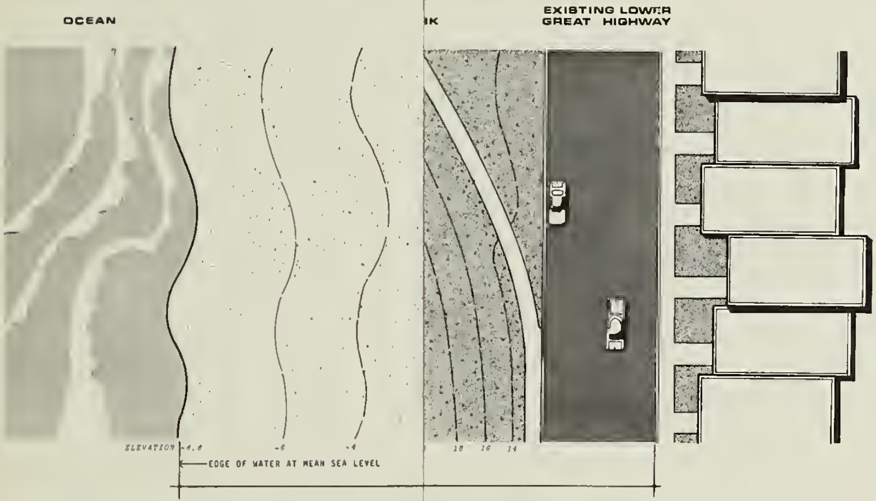
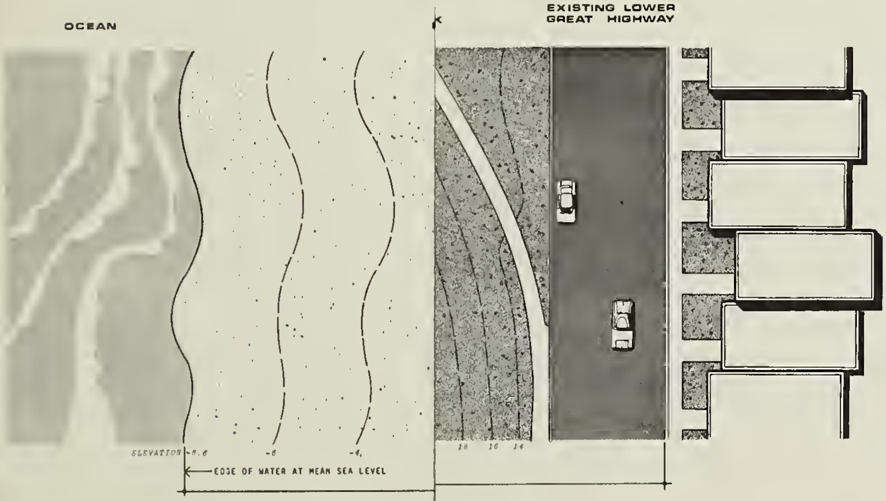


SCHEME 1

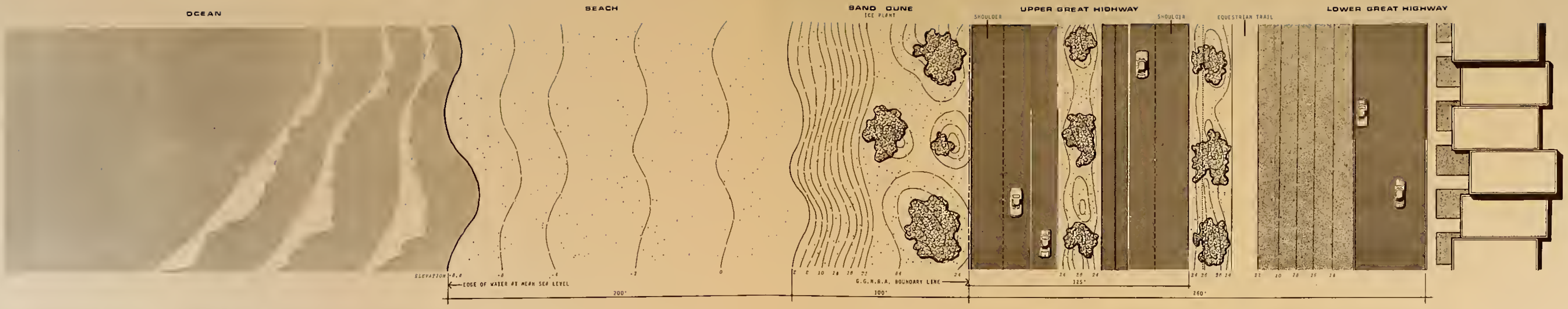


SCHEMES 2 & 3

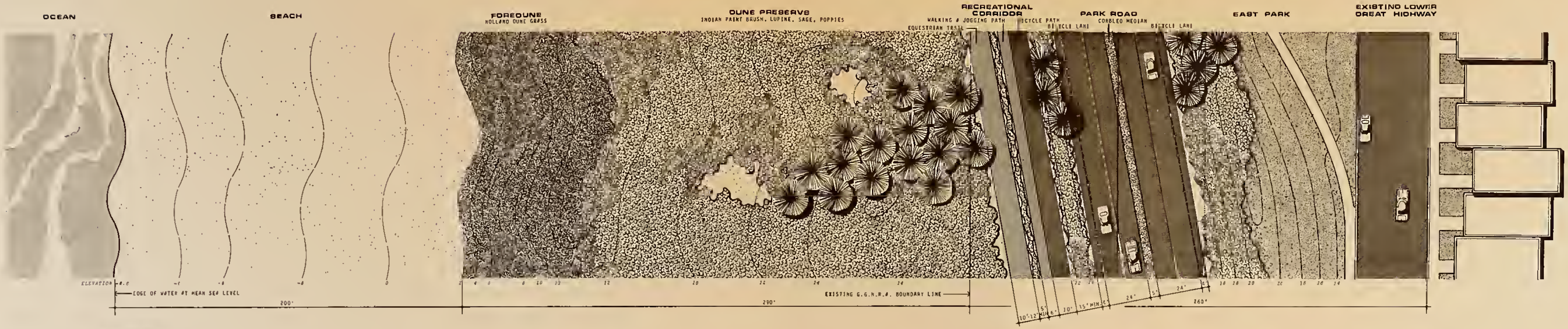
PARTIAL PLANS

SCALE: 20' 0' 20' 40'

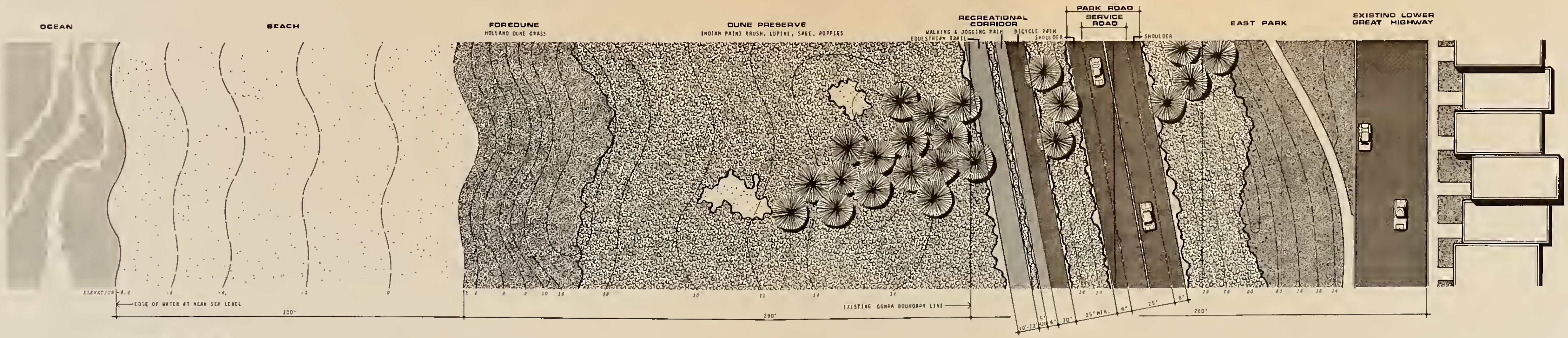
FIGURE 2



EXISTING CONDITIONS



SCHEME 1



SCHEMES 2 & 3

PARTIAL PLANS OF PARK ROAD & RECREATIONAL CORRIDOR

COMPARISON OF AMOUNT OF LAND DEVOTED TO CIRCULATION

	TOTAL CORRIDOR WIDTH	AUTOMOBILE CIRCULATION	RECREATIONAL CIRCULATION	MEDIANS & BUFFERS	% OF CORRIDOR AS OPEN SPACE
6 LANES (EXISTING)	500'	92'	10'	60'	65%
4 LANES	700'	48'	18'	25'	85%
2 LANES	700'	40'	28'	30'	86%
SERVICE ROAD	700'	25'	28'	36'	87%

FIGURE 2

Either of the four or two lane roadways could be connected directly into Sloat Boulevard with the beach road to the south closed to through traffic opposite the Zoo. In that case access to the beach road from Skyline and Sloat would be limited to vista point parking.

a. Four Lane Divided Roadway (Scheme One)

This scheme consists of a four lane roadway with two 12 foot wide lanes on each side of a 5 foot wide cobbled median strip. The northbound lanes would be generally at an elevation 2 feet above the southbound lanes to improve motorists' view of the ocean.

Four foot wide, paved bicycle lanes would occur along the outer edges of the roadway, signed and striped for the use of commuter bicyclists. (These bicyclists prefer to move along with the traffic and should be separated from slow-moving recreational bicyclists.)

b. Two Lane Roadway (Scheme Two)

This scheme consists of two 12 foot wide lanes separated by a 1 foot wide strip defined with plastic traffic buttons. Shoulders would be 8 feet wide and signed and striped for the use of any bicyclists who prefer to use the roadway.

c. Two Lane Service Road (Scheme Three)

This scheme consists of a two lane service road, 25 feet wide which would not be open to traffic, being limited only to vehicles for park maintenance, sand removal and police or emergency services. Other possible uses could include shuttle or tour buses. This service road would be needed because of the planned expanded width of this corridor. The Lower Great Highway, at an elevation 10 feet below the crest of the landscaped areas immediately to the west would not provide adequate access and surveillance of the enlarged recreation area.

5. PEDESTRIAN BEACH ACCESS

Existing pedestrian access to the beach opposite the Sunset District is through three narrow tunnels at Judah, Taraval and Wawona and at one crosswalk opposite Noriega. Because the tunnels are widely spaced, unattractive and commonly perceived as unsafe, many pedestrians risk crossing four lanes of traffic to get to the beach rather than use them.

Under the proposed redesign plan, illustrated in Figure 3, convenient paths leading to the beach would connect with every east-west street which now terminates at the Lower Great Highway. There would be twelve crossing points at an average distance apart of 950 feet. From any location along the Lower Great Highway, the longest distance to a pedestrian access point would be 550 feet.

Access to the beach under either of the road schemes would be via underpasses, overpasses or at-grade pedestrian crossings which would be

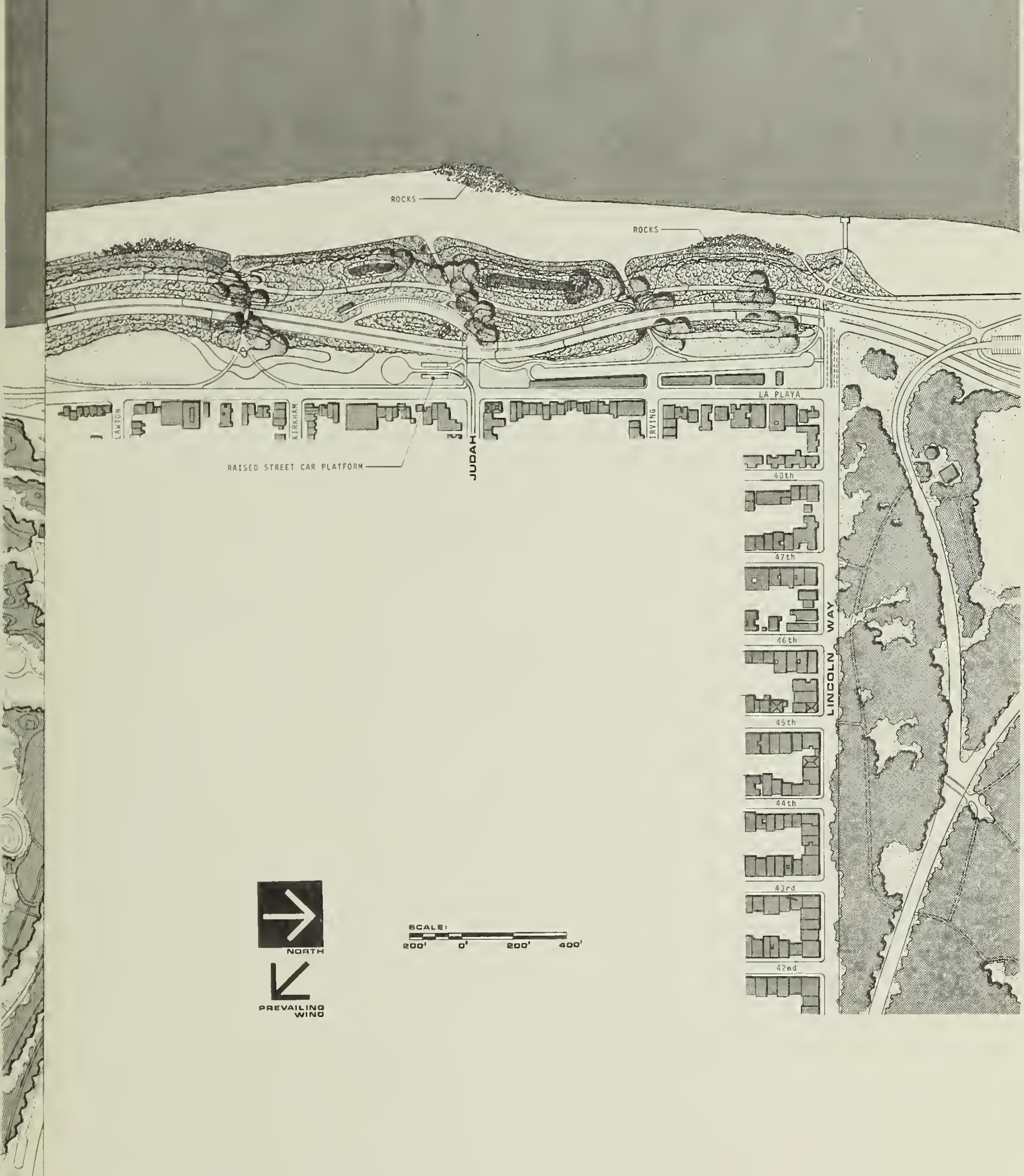
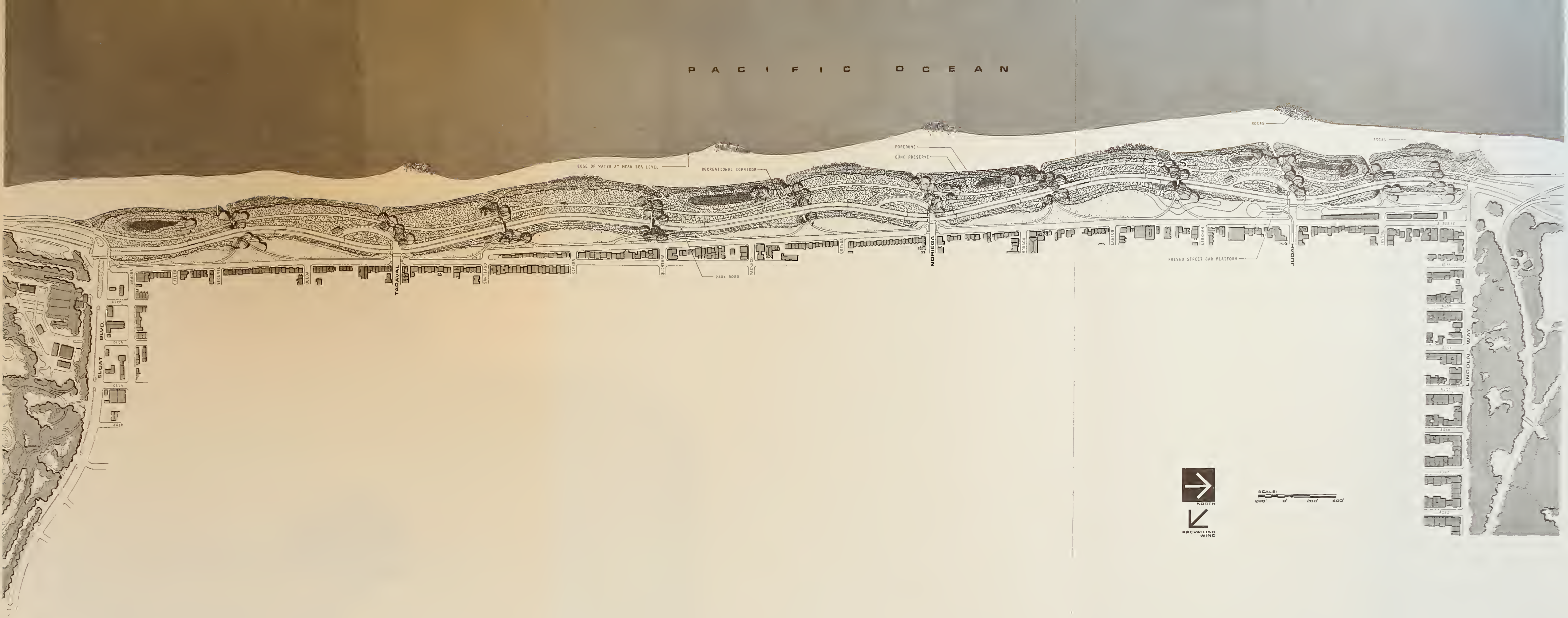

ROCKS
ROCKS
LA PLAYA
LAWTON
KIRKHAM
JUDAH
IRVING
RAISED STREET CAR PLATFORM
48th
47th
46th
45th
44th
43rd
42nd
LINCOLN WAY
NORTH
PREVAILING WIND
SCALE:
200'
0'
200'
400'

FIGURE 3

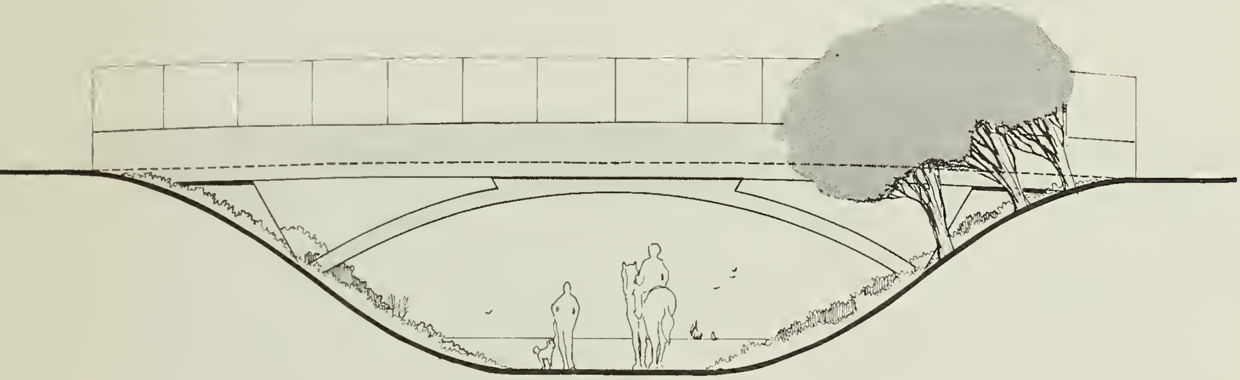


DESIGN PLAN
SLOAT BOULEVARD TO LINCOLN WAY

FIGURE 3

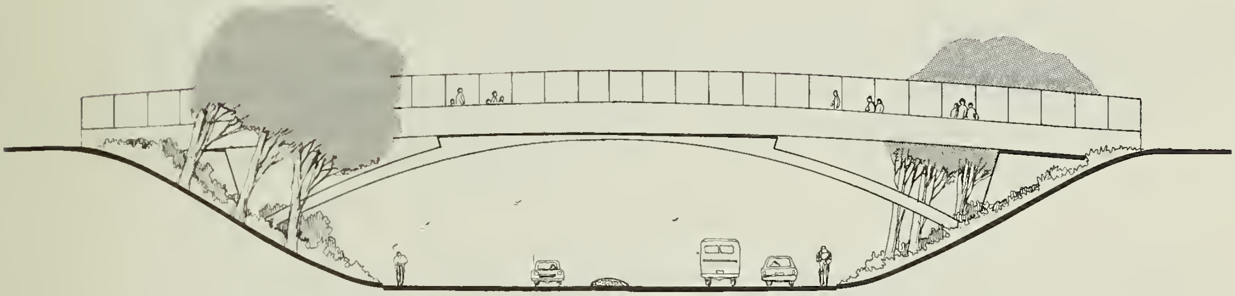
located at signalized intersections. Access walks, underpasses and overpasses would be oriented in a northeast-southwest direction, perpendicular to the prevailing wind for maximum shelter. Except in emergencies, motor vehicles would be prohibited from using these access routes by signing and bollards.

The four underpasses would be designed as attractive portals which would average 65 feet in length as opposed to the 174 to 224 foot length of the existing narrow tunnels. Wide and high enough to receive natural light through their portals during the day, and artificially lighted at night, the underpasses would be secure and attractive to all users. Under the four lane road scheme there would be a protected median roof opening to let in additional natural light and compensate for the additional length of underpass necessary to reach under the wider roadway. The portal openings on the west sides of the underpasses would be protected with planted wind breaks on the windward side.



TYPICAL PEDESTRIAN UNDERPASS

The three overpasses would be located at low points in the road profile where there would be sufficient clearance to smoothly connect to the path system without the necessity for either steps or excessive ramping. The top of the overpasses would be at elevation 33 while road grade would be at elevation 11.



TYPICAL PEDESTRIAN OVERPASS

6. PARKING

Parking lots located adjacent to the Zoo, Golden Gate Park and the former Playland-at-the-Beach site would continue to be the primary off-street parking areas. Although there would be a proposed reduction in the total number of parking spaces (See Table A) their distribution would be more useful in terms of access to Ocean Beach. Under either of the scenic road alternatives (Schemes One and Two) three vista point parking and rest areas would be located to the west of the roadway, providing a total of 120 spaces. These spaces would provide only a limited amount of short term parking and would not fully supply the parking needs of all potential park users. The three new parking areas would be curbed and bermed for screening and to prevent vehicles from encroaching on landscaped areas. Two spaces in each lot would be restricted to use by the handicapped. Precast concrete picnic tables, litter containers and benches could also be located at these points. These vista point parking areas would amount to only 1.5% of the total land area along this sector of Ocean Beach. Wayside exhibits could be located at each of these vista points, informing visitors about different aspects of the ecology of ocean, beach and dunes.

7. PUBLIC TRANSIT

The new Muni street cars, to be in service next year, will make pedestrian access to Ocean Beach via public transportation much more attractive. A landscaped, plaza-like "N" line terminus located in the park space adjacent to the intersection of Judah and the Lower Great Highway is illustrated on Figure 3 and has been reviewed by Muni. At Taraval the "L" line loops around 47th Avenue and 46th Avenue, one block away from the Zoo.

Coordination with Muni and the Golden Gate National Recreation Area will continue and the possibility of a line extension to the Zoo or of a shuttle bus connecting the Zoo with Golden Gate Park and the Cliff House will be explored. Present service along the Great Highway itself is limited to the No. 18 line, which uses the Great Highway between Lincoln Way and Fulton Street. Should new intersections be developed with the Upper Great Highway at Judah, Noriega and Taraval, additional bus stops could be introduced at those points to improve pedestrian access to Ocean Beach via public transit.

8. EAST PARK

This linear park would vary in width from 40 feet to 270 feet and would occupy the area between the Upper Great Highway or service road and the residential area along the Lower Great Highway (See Figure 3). This space would be recontoured to a series of small green glades similar to those along the drives in Golden Gate Park. The west edge of this park area would serve as a landscaped berm to screen the circulation corridor from residential view and deflect sound and wind. This space also would function as a back dune to trap windblown sand and would be planted with ground cover and shrubbery. Grass would be planted along the entire length of East Park adjacent to the Lower Great Highway extending into the four broader park areas which could be used for informal recreation, relaxation and picnicing in the wind shelter afforded by the back dune slope.

Due to the convenient and frequent access between this area and the beach, a family could picnic in the shelter of such a passive park, then procede to either the beach area or the recreational corridor. A limited number of park benches or related appurtenances would be provided. Trees would be used only in widely spaced windbreaks and to frame and enhance ocean vistas from residential areas. Two-thirds of the park area would be open for maximum sunlight and views.

9. LOWER GREAT HIGHWAY

Cul-de-sac closures of the Lower Great Highway at Sloat, Taraval, Noriega, Judah and Lincoln are suggested under all three roadway redesign schemes. (See Figure 3) They would have the effect of making the street a quiet frontage road, which would enhance the residential quality of the area and the East Park.

Ramped curbs would be provided at the cul-de-sacs for the benefit of bicyclists or handicapped. Emergency fire truck access would also be maintained by providing 14 foot wide concrete walks between the curb sections at these points.

To further enhance the new recreational area, utility wires along this corridor should be undergrounded.

B. LINCOLN WAY TO FULTON STREET

In this area, Golden Gate Park would be extended to the existing sea wall, removing what is presently a wide expanse of asphalt and replacing it with an area of grass and a landscaped parking area, screened with berming. (See Figure 4) The number of parking spaces along this area of Ocean Beach would be reduced from 800 to 200. Through traffic along the Great Highway would be served by a transverse park road depressed approximately 6 to 10 feet below grade and located immediately behind the existing Cypress trees across the west edge of the existing soccer fields. A 30 foot wide landscaped crossing would be developed over the road to further enhance the feeling of the park extending to the ocean.

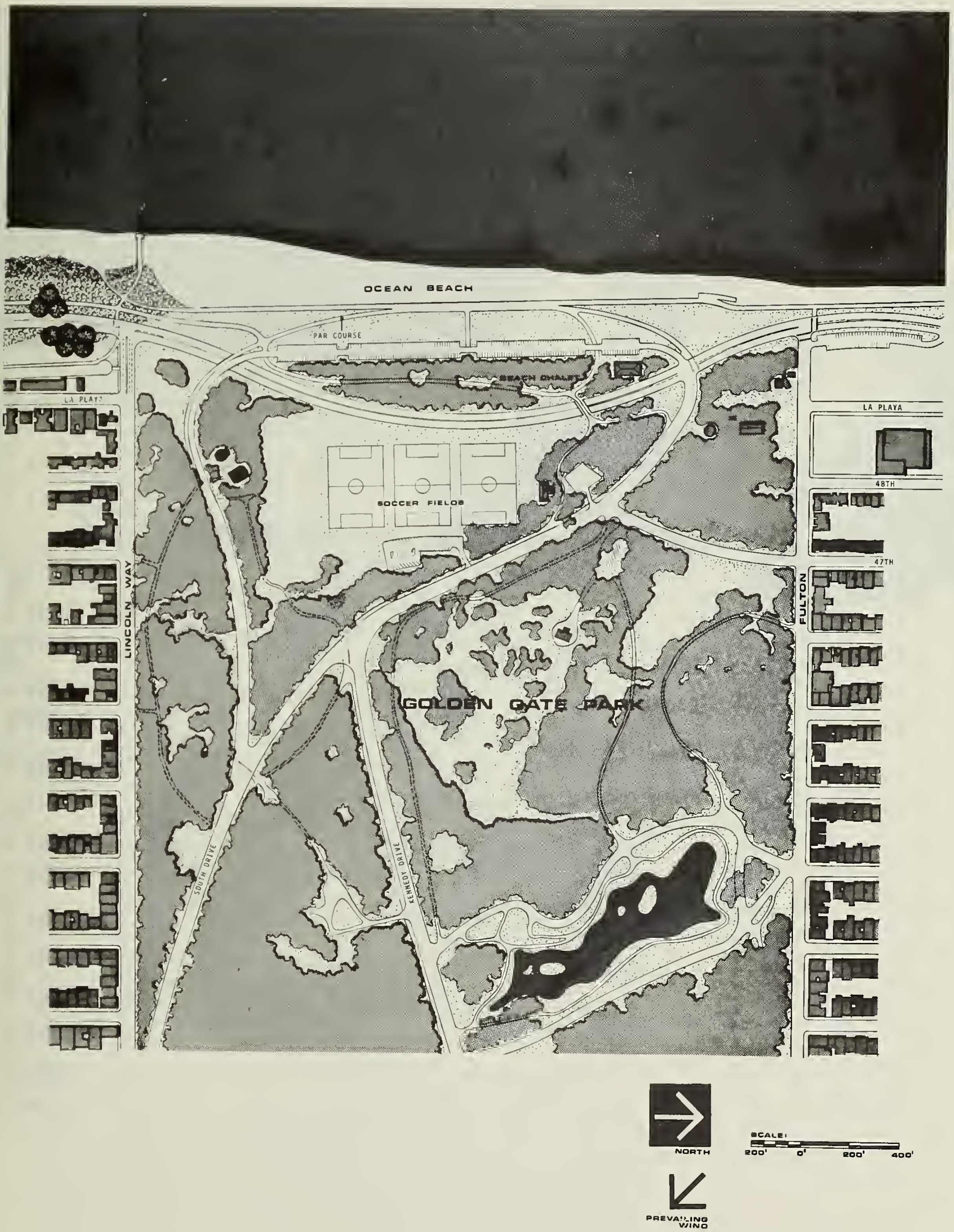
The proposed alignment of this park drive would necessitate the repositioning of the soccer fields further to the east in order to preserve the existing Cypress trees. This alignment would have to be approved by the Recreation and Park Commission. Final plans to the east of the depressed roadway will be developed as part of the Recreation and Park Department's current updating of the Plan for Golden Gate Park and funding for work in this area would not be available under the Wastewater Management Program. Should funds be allocated for the removal of the sewage treatment plant located to the east of the soccer fields after construction of the new facility near the San Francsico Zoo makes it obsolete, there would be an opportunity for the development of additional recreational facilities at the western end of Golden Gate Park.

C. FULTON STREET TO SUTRO HEIGHTS PARK

This northern section of the Great Highway is highly visible from the bluffs at Sutro Heights Park and the Cliff House. Viewed from the opposite direction, these natural headlands, together with Marin's mountains and the Seal Rocks, form a dramatic backdrop to this space. The beach, sea wall and pedestrian promenade would be retained as they presently exist. However the roadway in this area should be improved to meet present road and safety standards, which would require the separation of through traffic from parking areas. The plan, illustrated in Figure 5, indicates a four lane divided road elevated above the parking areas, which would be located to the west of the roadway along the promenade. This area would contain two rows of perpendicular parking and would be separated from the southbound lanes of the roadway by a landscaped berm, the top of which would not obscure a motorists ocean view. The north and southbound lanes would be separated with a 5 foot wide cobbled median strip. The alignment of the road would be adjusted to continue the curvilinear feeling with the northbound lanes at a higher elevation than the southbound lanes.

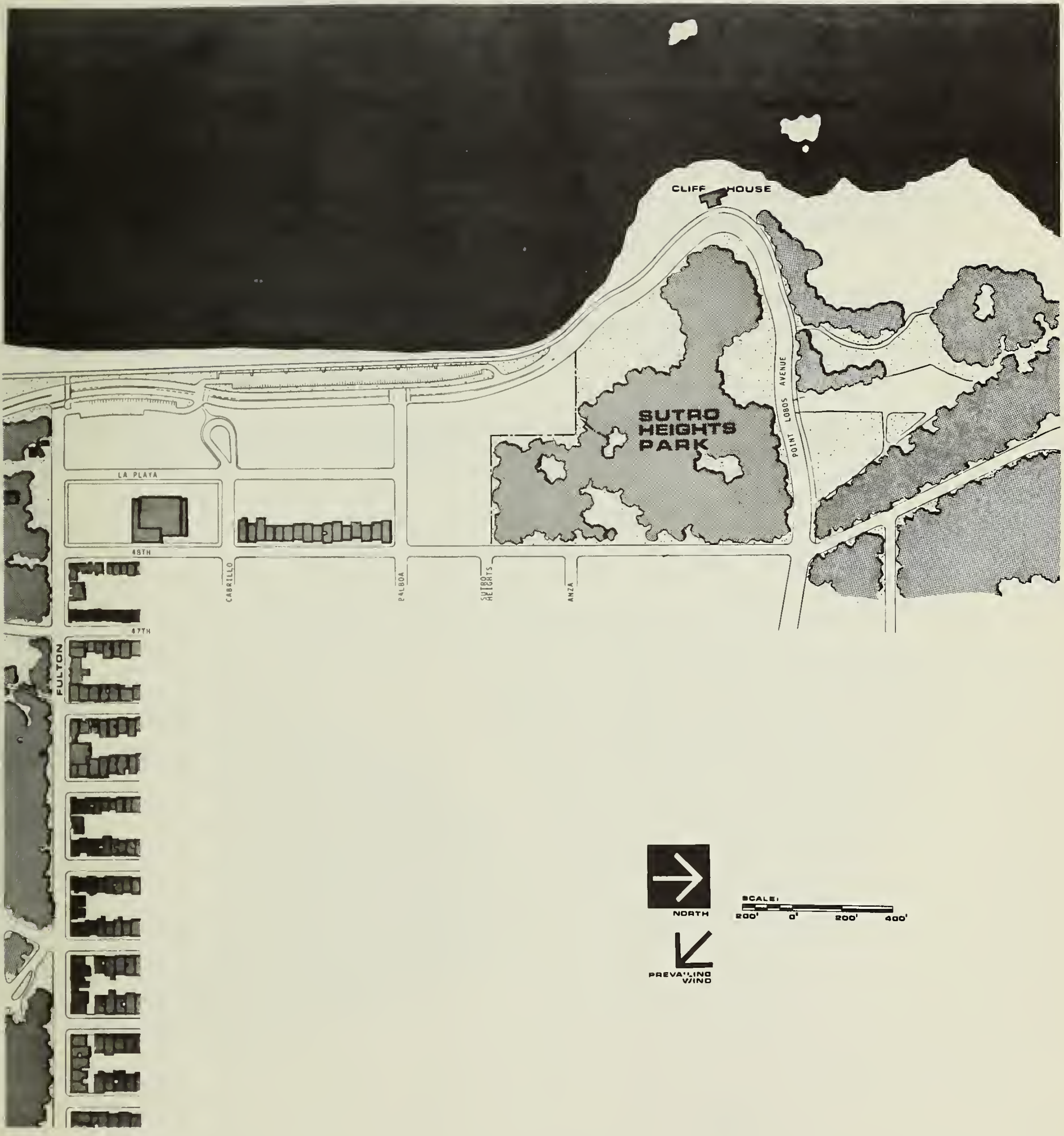
Between Cabrillo and Fulton the roadway would curve toward the ocean, making room for a smaller parking area on its east side.

Total parking across from the former Playland-at-the-Beach property would be reduced from 500 spaces to 300.



DESIGN PLAN
LINCOLN WAY TO FULTON STREET

FIGURE 4



DESIGN PLAN
FULTON STREET TO SUTRO HEIGHTS PARK

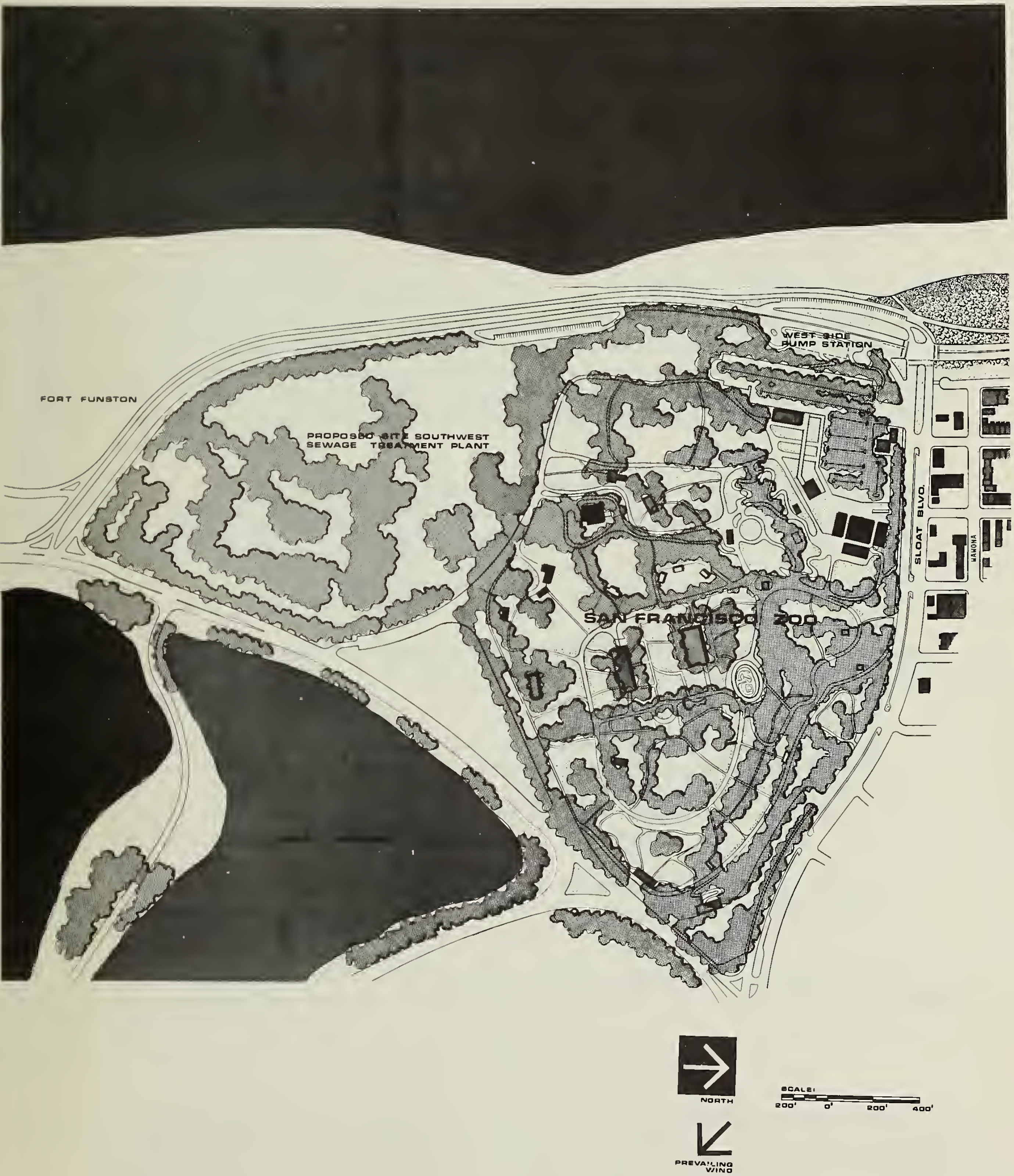
FIGURE 5

D. SLOAT BOULEVARD TO SKYLINE BOULEVARD

This southern section of the highway presents broad views of ocean and the high bluffs of Fort Funston, which form the southern terminus of the corridor. The roadway rises from elevation 18 near Sloat Boulevard to elevation 62. Its alignment would be redesigned to accommodate the new pump station, rejoining the existing roadway just past the second existing parking lot. (See Figure 6) The design of the roadway would be similar to that between Lincoln and Sloat Boulevard, which was described previously. However, with the four lane scheme there would be a greater separation in grade between north and southbound traffic in some locations.

Should the roadway between Skyline Boulevard and Sloat Boulevard be closed to through traffic, to reduce the amount of nonrecreational traffic on the Upper Great Highway between Sloat and Lincoln, access would only be provided to vista points and parking areas.

Recreational trails from the north would continue in this area on the west edge of the road and would connect to recreational trails at Fort Funston.



DESIGN PLAN
SLOAT BOULEVARD TO SKYLINE BOULEVARD

FIGURE 6

III. IMPACT ON VEHICULAR TRAFFIC AND PARKING

A. VEHICULAR TRAFFIC

1. BACKGROUND

The West Side Transport Environmental Impact Report indicates that the present four lane roadway with a linear alignment has the capacity to accommodate 1,600 cars per hour northbound and 2,400 cars per hour southbound. Existing weekday traffic peaks at 700 cars per hour northbound in the morning and 1,100 cars per hour southbound in the late afternoon. Existing weekend traffic peaks in the late afternoon with 1,000 cars per hour traveling northbound and 1,200 cars traveling southbound. The EIR further projects that without any improvement of the Ocean Beach recreational area demand is not likely to increase by more than 10 percent over the next twenty years. Therefore, within twenty years the existing roadway would be utilizing 69% of its capacity northbound and 55% of its capacity southbound.

The following analysis is drawn from pages 155l - 157 of the Final Environmental Impact Report, West Side Transport/Storage Project. It concentrates on the impacts which the three proposed roadway schemes would have on traffic flow.

2. LOWER GREAT HIGHWAY

All three roadway schemes call for cul-de-sac closures of the Lower Great Highway at Sloat, Taraval, Noriega, Judah and Lincoln and the closure of 48th Avenue at Taraval.

"The proposed cul-de-sacs on the Lower Great Highway would decrease traffic from its present 4,700 vehicles per day to about 250 vehicles per day from Lincoln Way to Judah Street and Ulloa Street to Wawona Street; 500 to 700 from Judah to Moraga and Ortega to Santiago; and 100 from Moraga to Ortega and Santiago to Ulloa."

"Traffic volumes on 47th and 48th Avenues would increase by 700 to 1,400 vehicles per day since 15 to 30 percent of the existing Lower Great Highway traffic would be diverted to these streets."

"The installation of the cul-de-sacs on the Lower Great Highway would also require the rerouting of the No. 16 and No. 71 buses between Noriega and Ortega Streets."

3. FOUR LANE UPPER GREAT HIGHWAY (SCHEME ONE)

The introduction of three intersections with the Upper Great Highway under the four lane scheme would lead to an increase in traffic on each of these streets by 800 to 1,500 vehicles per day. Present traffic volumes of 4,200 vehicles per day on Judah Street would increase by 19 to 36 percent; present volumes of 6,000 on Noriega Street would increase by 13 to 25 percent; and present volumes of 5,000 on Taraval Street would increase by 16 to 30 percent. All the streets, including the Upper Great Highway currently operate at the highest level of service with free flow, low volume and high speeds and would continue to do so. (See Figure 7)

"Under redesign scheme one, the heights of the roadway and dune area would be lowered to allow both northbound and southbound motorists to have a view of the ocean. This and other improvements to the corridor could generate more weekday and weekend traffic on the Upper Great Highway. It is difficult to determine what this potential increase in traffic could be, since it would depend on public acceptance of the new design. On weekdays, the increase could be as much as 15 percent; on weekends, up to 25 percent. This maximum increase could put the Upper Great Highway at 78 percent of capacity."

"The overpasses and the underpasses should decrease the number of people making at-grade crossings of the Upper Great Highway, thereby increasing its safety. The recreational corridor of bicycle, equestrian and pedestrian paths with an improved view of the ocean could be more heavily used than the existing paths."

The provision of two lanes in each direction would facilitate passing slow vehicles and enhance traffic operations in cases of lane blockage due to breakdown or maintenance activities.

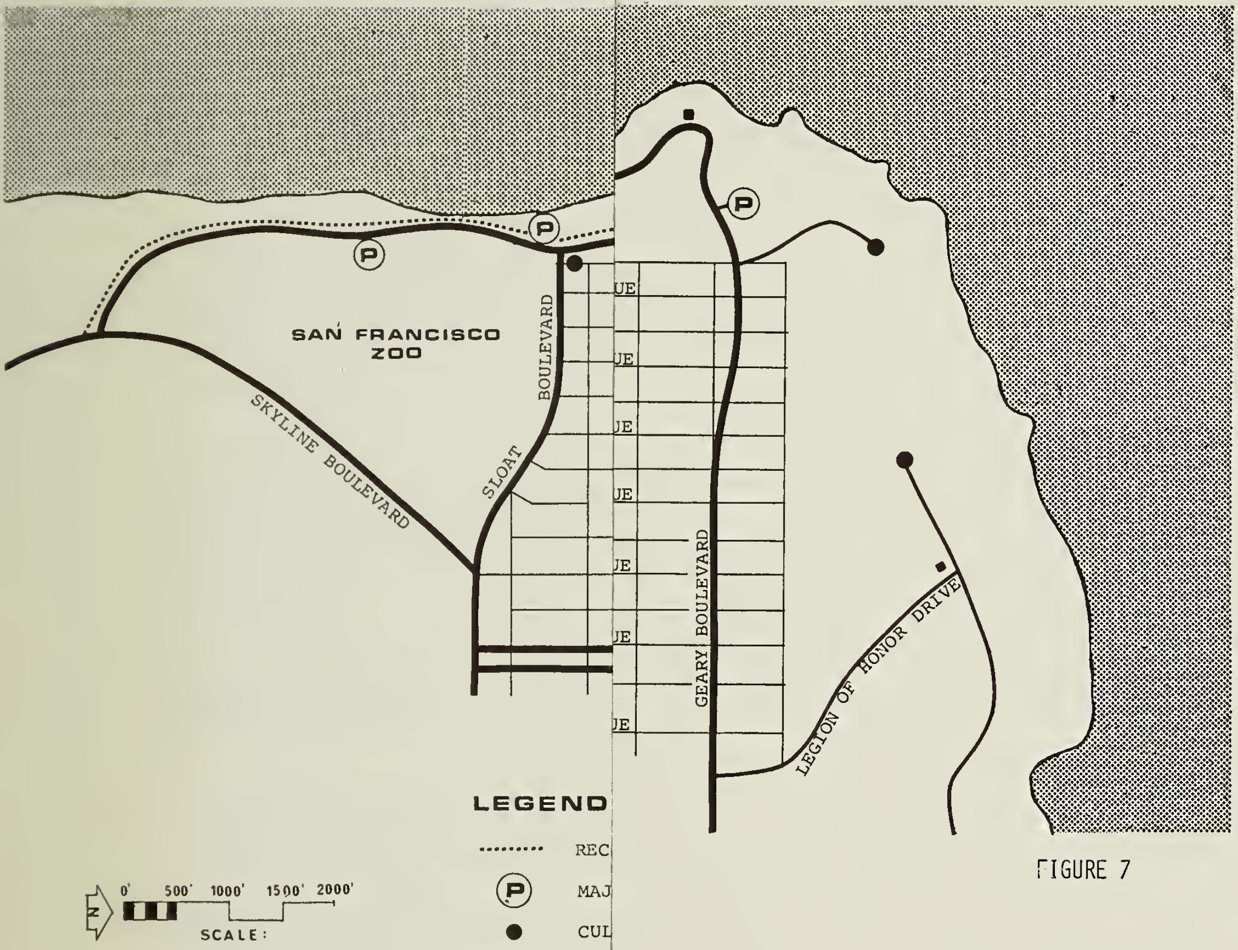
4. TWO LANE UPPER GREAT HIGHWAY (SCHEME TWO)

If this scheme was implemented, the increases in traffic due to the improvements to the corridor which are described above could still be expected to occur. At the same time the capacity of the Upper Great Highway would be reduced from about 2,400 to 900 vehicles per hour southbound and from 1,600 to 600 vehicles per hour northbound. The demand for travel for the (1) weekday morning peak period northbound, (2) weekday afternoon peak period southbound, and (3) Sunday afternoon peak period (1 to 4 p.m.) in both directions would exceed the roadway capacity. During these periods the level of service would be reduced to the point where flow would be unstable and there might be stoppages of momentary duration.

Some 1,000 trips would be diverted from the Upper Great Highway on weekdays, and 4,000 north/south trips would be diverted on an average Sunday. Due to the cul-de-sacs on the Lower Great Highway, this traffic would divert to 41st Avenue, 47th Avenue, 48th Avenue, Sunset Boulevard and 19th Avenue as follows:

	Additional Vehicles per Day
41st Avenue	50 on weekdays and 200 on Sundays
47th Avenue	900 on Sundays
48th Avenue	900 on Sundays
Sunset Boulevard	300 on weekdays and 1,000 on Sundays
19th Avenue	500 on weekdays and 1,600 on Sundays

If either the four or two lane schemes were varied to provide for the closure of the Upper Great Highway Extension south of Sloat Boulevard, Sunset Boulevard would receive the heaviest impact. Traffic would increase by about 10 percent to 10,000 vehicles per day total on weekdays and by 50 percent to 15,000 vehicles per day total on weekends. These traffic increases would require signalization of the intersection of Sloat and Skyline Boulevards. Even with signalization, this intersection would be congested during peak periods.


SAN FRANCISCO ZOO
SKYLINE BOULEVARD
SLOAT BOULEVARD
GEARY BOULEVARD
LEGION OF HONOR DRIVE
UE
UE
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UE
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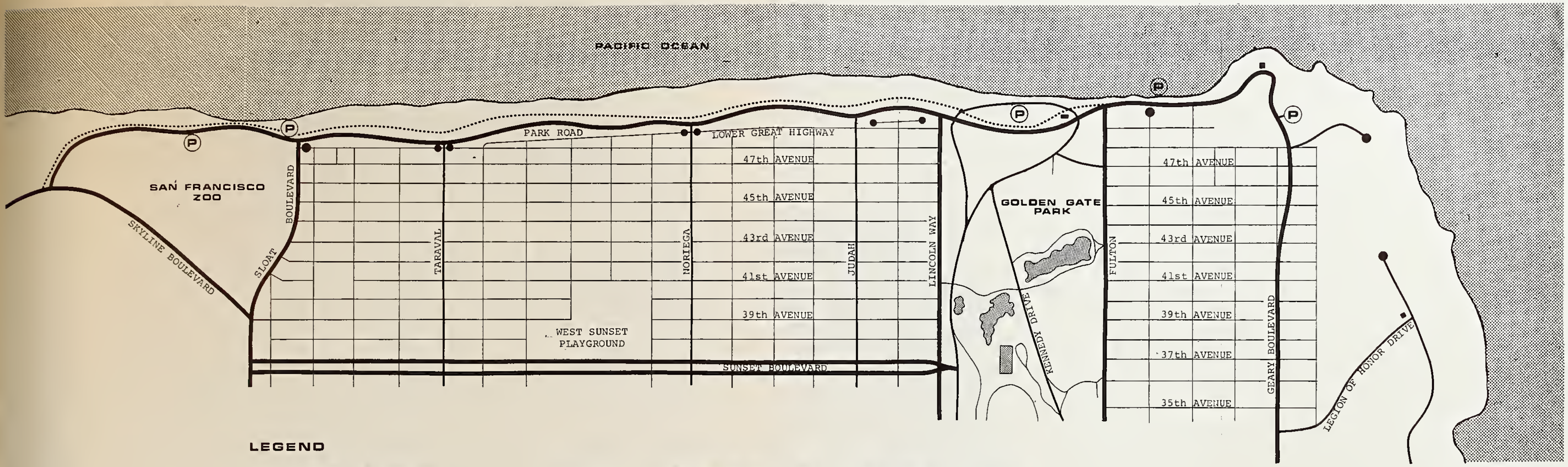
P
LEGEND
REC
MAJ
CUL
N
0' 500' 1000' 1500' 2000'
SCALE:

FIGURE 7



LEGEND

········ RECREATION CORRIDOR

Ⓟ MAJOR PARKING AREAS

● CUL-DE-SAC

N 0' 500' 1000' 1500' 2000' SCALE:

LOCAL ACCESS - SCHEMES 1 & 2

FIGURE 7

A traffic decrease would occur on the Upper Great Highway between Sloat and Lincoln Way. However, under a two lane scheme, traffic would still be at or near capacity at peak periods. Under a four lane scheme traffic would remain at the highest level of service. Traffic volumes on east-west streets intersecting the Upper Great Highway could be expected to be as described above under schemes one and two respectively.

5. TWO LANE SERVICE ROAD (SCHEME THREE)

If the Upper Great Highway was closed to through traffic between Lincoln Way and Sloat Boulevard all the traffic which presently uses it would be diverted to other north-south routes. This north-south travel demand would decrease by 5 to 10 percent due to the road closure, but 90 to 95 percent of the trips made on the Upper Great Highway are made for reasons other than to view the Ocean. Therefore, most of the north-south trips would still be made.

Sunset Boulevard would receive most of the diverted traffic (about 70 percent on weekdays and 60 percent on weekends). The number of vehicles using Sunset would increase by about 8,000 vehicles in 24 hours on weekdays and about 11,000 vehicles in 24 hours on Sundays. These traffic increases would cause congestion during peak hours at Sunset's interchanges with Sloat Boulevard and Lincoln Way.

Traffic would increase in Golden Gate Park by 1,800 to 2,000 vehicles per day on roads other than Route 1. Most of this traffic would use John F. Kennedy Drive, South Drive and Chain of Lakes Drive to get to 41st Avenue and Sunset Boulevard. Traffic on 41st Avenue between Lincoln and Irving would increase by 2,800 to 3,000 vehicles per day (total both directions) on weekends.

Mitigation measures should be provided on Lincoln Way to keep traffic diverted from the Upper Great Highway out of the neighborhoods. These mitigation measures could be any of the following:

1) Creation of cul-de-sac streets on all or some of the streets between the Upper Great Highway and 41st Avenue (by placing barriers across the streets where they intersect Lincoln Way).

2) Partial closure of all or some of the streets between the Upper Great Highway and 41st Avenue (by placing barriers on the western half of such streets at Lincoln Way). This would allow local traffic to exit onto Lincoln Way; eastbound and westbound traffic on Lincoln Way would be restricted from turning into these local streets.

3) Closure of all the turn openings into the median of Lincoln Way from the Upper Great Highway to 41st Avenue and the use of the median to separate "through" and "local" traffic.

All three of these mitigation measures would result in significant increases in traffic on Irving Street. Under 3) above the traffic would

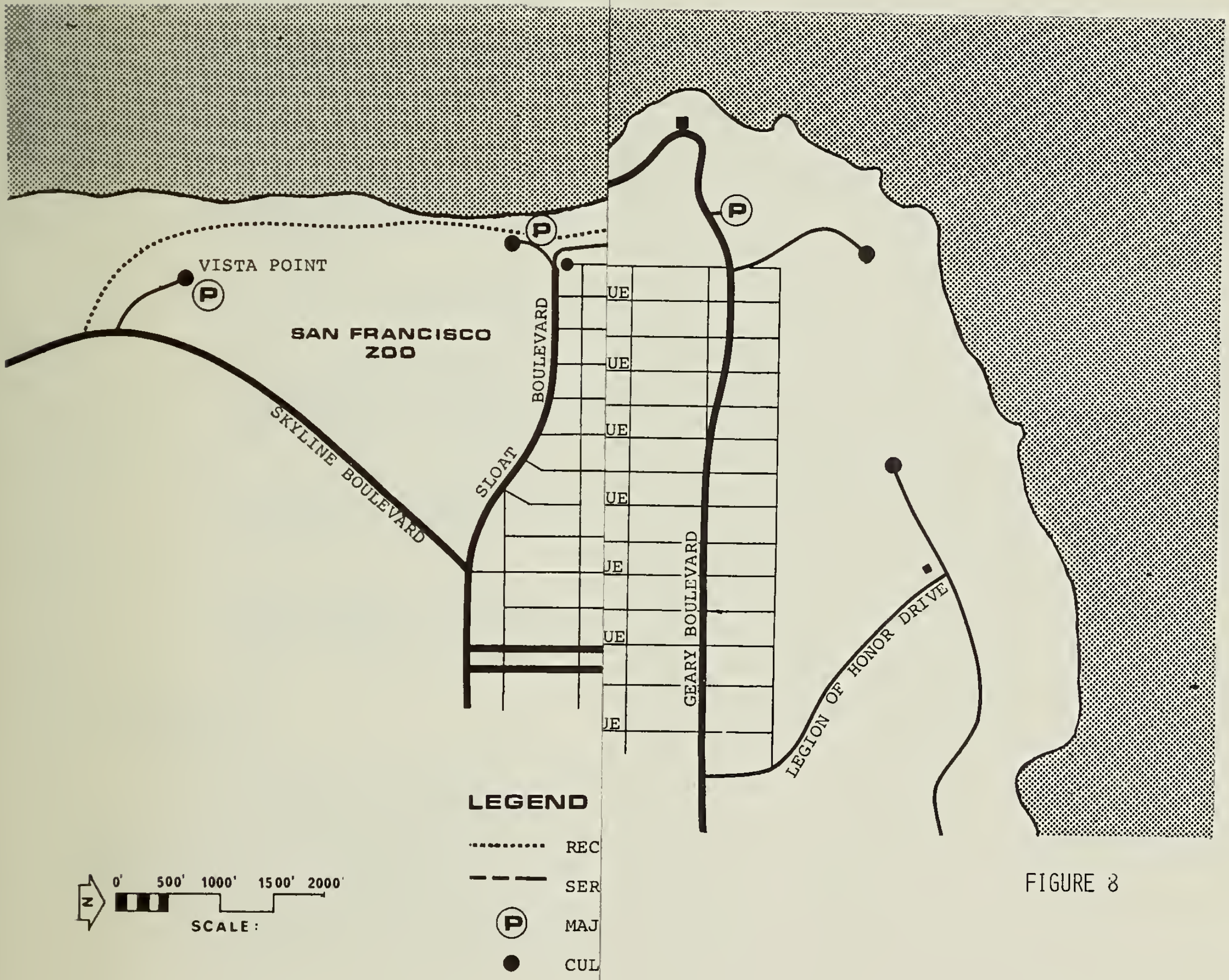

VISTA POINT
P
SAN FRANCISCO ZOO
SKYLINE BOULEVARD
SLOAT
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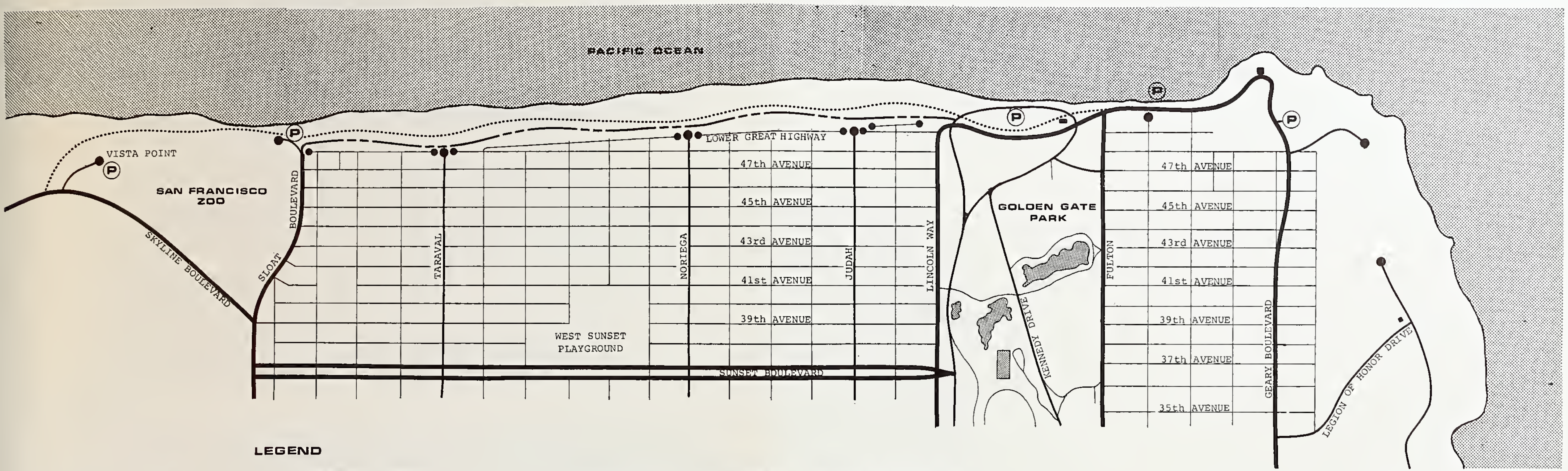
FIGURE 8



LOCAL ACCESS - SCHEME 3

FIGURE 8

more than double, increasing by about 1,000 vehicles per day in each direction. Measure 2) above would lessen the increase in traffic on Irving Street and would also lessen the impacts on the residents of the local north-south streets while protecting them from the north-south "through" traffic diverted from the Upper Great Highway. The impacts of these three mitigation measures are discussed in more detail on pages 155*a* through 155*f* of the Environmental Impact Report.

6. INTERSECTIONS (FOUR AND TWO LANE SCHEMES)

The impacts of construction of additional intersections with the Upper Great Highway at Noriega, Taraval and Judah Streets would be as follows:

a. A more direct access to the Upper Great Highway from the Sunset District would increase the utility of this highway for local residents.

b. Police surveillance of the roadway would be facilitated.

c. The proposed intersections, together with the associated signs and other traffic control devices would tend to make regulation of traffic speeds on the Upper Great Highway more practical.

d. Vehicular intersection accidents would be increased; however, speeding accidents would be decreased.

e. The intersections, with well-defined crosswalks would aid pedestrians crossing at-grade, resulting in safer beach access and a reduction in pedestrian/vehicle accidents.

B. PARKING

As illustrated in Table A, the median of the Great Highway between Fulton and Lincoln presently contains about 800 parking spaces and the median between Fulton and Balboa contains 501 spaces. The Lower Great Highway can accommodate 425 vehicles along the west curbs and 300 vehicles along the east curbs. There are two parking lots on the west side of the Upper Great Highway south of Sloat Boulevard, each accommodating about 100 vehicles.

Under the four and two lane schemes parking spaces would be reduced to 300 between Fulton and Lincoln, 300 between Fulton and Balboa, 700 along the Lower Great Highway and 110 along the Upper Great Highway south of Sloat Boulevard. In addition there would be 120 new spaces created in three parking areas to be located between Lincoln and Sloat on the west side of the roadway.

On May 1, 1977, a warm Sunday, a study of the usage of the existing parking areas south of Fulton was conducted between the hours of 12 p.m. and 8 p.m. by staff members of Alan M. Voorhees and Associates as part of the research for the Environmental Impact Report. It was found that a maximum of 140

vehicles (4:00 p.m. to 5:00 p.m.) were parked in the median of the Great Highway between Fulton and Lincoln Way. The Lower Great Highway had a maximum of 80 cars parked on the west curb between Lincoln and Sloat. This volume and its distribution along the roadway was constant between 2:00 p.m. and 5:00 p.m. There was a maximum of 83 vehicles on the east side of the Lower Great Highway. This volume and its distribution along the roadway was constant between 2:00 p.m. and 7:00 p.m. The two parking lots on the west side of the Upper Great Highway south of Sloat Boulevard had a maximum of 59 vehicles between 2:00 p.m. and 4:00 p.m. The survey did not include the parking area in the median of the Great Highway between Fulton and Balboa.

Under either the four or two lane redesign schemes (Schemes One and Two) the parking areas between Fulton and the San Francisco Zoo would have been able to accommodate double the number of cars parking in this area on Sunday, May 1, 1977. In addition, 120 more spaces would have been provided on the west side of the Upper Great Highway, furnishing parking for recreational drivers where none exists today. A total of 1,530 spaces would be provided, with a net decrease of 696 spaces.

Parking under the service road scheme (Scheme Three) would be identical to that under the four and two lane schemes except that the three new parking areas on the west side of the Upper Great Highway would not exist, increasing the net decrease to 816.

IV. RESPONSE TO GOVERNMENTAL POLICIES

A. COMPREHENSIVE PLAN OF THE CITY AND COUNTY OF SAN FRANCISCO

The following policies and objectives of the Comprehensive Plan relate to the proposed redesign of the shoreline area between Sutro Heights park and Fort Funston. A more complete review of the Great Highway Redesign Plan's conformance with City policies will be made by the City Planning Department as part of their assessment prior to the Master Plan Review hearing.

Conservation Element

Objective 1: Achieve a proper balance among the conservation, utilization and development of San Francisco's natural resources.
Policy 1: Conserve and protect the natural resources of San Francisco.
Policy 2: Improve the quality of natural resources.
Policy 3: Restore and replenish the supply of natural resources.

Urban Design Element

Objective 1: Emphasis of the characteristic pattern which gives to the City and its neighborhoods an image, a sense of purpose, and a means of orientation.
Policy 11: Indicate the purpose of streets by means of a citywide plan for street lighting.
Objective 2: Conservation of resources which provide a sense of nature, continuity with the past and freedom from overcrowding. "Natural areas and features such as sand dunes, cliffs, hills and beaches - particularly where a relatively undisturbed natural ecology exists - are irreplaceable and of special public value and benefit within an intensely developed city.
Street Space:
Policy 9 : Review proposals for the giving up of street areas in terms of all the public values that streets afford. No release of a street area shall be recommended which would result in detriment to vehicular or pedestrian circulation.
Objective 4: Improvement of the neighborhood environment to increase personal safety, comfort, pride and opportunity.
Policy 14: Separation of pedestrian and vehicle movement eliminates conflicts and contributes to pedestrian comfort.
Policy 15: In the design of new pedestrian areas, changes of level can add greatly to interest and amenity if a reasonable relationship between levels is maintained. Most important is the visual connection between levels, which enhances the experience of being on one level through awareness of the other level(s).
Policy 28: If auto traffic and parking in parks are discouraged, recreational use can be increased.
Policy 31: Street right-of-way carried through to the water allow views directly to the waterfront and provide a sense of contact with the water.

Recreation & Open Space Element

Objective 2: Maintain an unbroken stretch of public open space from Fort Funston through Aquatic Park. Retain the natural character of open space areas from Fort Funston to the Eastern Edge of the Presidio.

Policy 2: Improve the quality of existing shoreline recreation areas.

Policy 3: Provide new public parks and recreation facilities along the shoreline.

Great Highway Develop entire Great Highway right-of-way into a smooth curvilinear recreational drive through a park area. Emphasize slow pleasure traffic and safe pedestrian access to the beach. Provide new parking areas on beach side where plan allows. Design parking to afford maximum protection to dune ecosystem. Create new playgrounds on inland side for adjacent neighborhoods, and provide for bicycle pedestrian and equestrian activities.

Ocean Beach Continue as natural beach area for public recreation. Improve and stabilize sand dunes where necessary with natural materials to control erosion.

Golden Gate Park Strengthen visual and physical connection between the park and beach. Improve the western end of the park for public recreation and when possible eliminate the the sewer treatment facilities.

Objective 3: Develop a diversified and balanced system of citywide recreation and open space.

Policy 1: Preserve public open space.

Policy 3: Gradually eliminate nonrecreational uses in parks and playgrounds and reduce automobile traffic in and around public open spaces.

Transportation Element

Thoroughfares Plan: In addition to the general objectives and policies of this portion of the Transportation Element the Thoroughfares Plan classifies the Great Highway as a "Recreational Street" and states that the design capacity of this road should be reduced substantially to correspond with its recreational functions; emphasis to be on slow pleasure traffic and safe pedestrian crossings.

Objective 1: Establish a thoroughfares system in which the function and design of of each street are consistent with the character and use of adjacent land.

Policy 1: Divert through automobile and truck traffic from residential neighborhoods onto major and secondary thoroughfares and limit major thoroughfares to non-residential streets wherever possible.

Policy 2: Design streets for a level of traffic that will not cause a detrimental impact on adjacent land uses.

Policy 4: Discourage nonrecreational and nonlocal traffic in and around parks and along the shoreline recreation areas.

Objective 3: Provide safe and pleasant space for pedestrians.

Objective 4: Allow for the safe use of the bicycle as a means of transportation and recreation.

Resolution #195-77 which was passed by the Board of Supervisors on March 21, 1977 also forms a portion of current San Francisco City Policy with regard to the Great Highway. This resolution called for the redesign of the Great Highway as a curvilinear roadway with two lanes in each direction.

The program of beach and dune restoration recommended under all three schemes is strongly responsive the the Conservation, Urban Design and Recreation and Open Space Elements of the Comprehensive Plan. The natural ecology of the beach would be restored as much as is possible without encroachment upon residential areas and the quality of the existing shoreline recreation areas would be greatly enhanced. In addition, there would be an opportunity under all three schemes to strengthen the connection between the western end of Golden Gate Park and the beach. The future elimination of the sewage treatment facilities is called for, although it could not be funded as part of the Great Highway Redesign.

All three proposed schemes improve pedestrian access to the beach areas significantly - adding seven crossing points between Sloat and Lincoln. In addition the quality of the pedestrian access would be improved both aesthetically and from a personal safety point of view. This fulfills a major requirement of the Recreation and Open Space Element.

Pedestrian overpasses as well as improved underpasses are suggested, both to make possible a variety of elevations along the Great Highway and also because they are significantly less expensive than underpasses, which must bear the weight of automobile traffic. Both underpasses and overpasses would be in conformance with policies 14 and 15, Objective 4 of the Urban Design Element, which suggest separation of pedestrian and vehicle movement and changes of level. Specifically with regard to policy 15, because the overpasses would be constructed at low points in the road profile,eliminating the necessity for either steps or excessively steep ramping, the pedestrian would perceive himself to be in a pleasant space with a sense of overlook and advantage. At the same time the elevation of the overpasses would remain low enough to preserve views to the ocean from residences bordering the Lower Great Highway.

The Recreation Corridor proposed under all three schemes would provide additional recreational opportunities for hikers, joggers, bicyclists and equestrians in conformance with Policy 3 of the Recreation and Open Space Element.

No playgrounds are being suggested for the East Park area, which is in conflict with Policy 3 of the Recreation & Open Space Element as considerable opposition was expressed from the adjacent neighborhood.

No program of street lighting is called for under any of the three schemes for the area between Sloat and Lincoln. This is in conflict with Policy 11, Objective 1 of the Urban Design Element, which illustrates high intensity, white lighting from fixtures mounted on alternately spaced light standards along the full length of the Upper Great Highway. Street lighting in this area is not recommended as part of the concept plan because the light standards would constitute a visual obstruction along the Upper Great Highway and night lighting would detract from the experience of driving along the ocean at night - making it impossible to see the ocean from a car or residence on a moonlit night. However lighting would occur at all intersections and may occur between Lincoln Way and Sutro Heights Park where the road is not opposite existing residential areas.

Within the Transportation Element there are objectives which conflict when applied to the Great Highway and Ocean Beach area. A "recreational street" in the terms of the Thoroughfares Plan is one designed to provide primarily for slow pleasure drives, cyclist and pedestrian use. The order of priority for this type of street is to accommodate 1) pedestrians, 2) cyclists, 3) equestrians and 4) automobile scenic driving. The Thoroughfares Plan classifies the Great Highway as a "recreational street". If the Great Highway were developed as a "recreational street" in the terms of the Thoroughfares Plan, a significant amount of nonrecreational traffic would divert into residential neighborhoods in conflict with Objective 1 of the Transportation Element.

The three alternate roadway schemes were developed in response to the above conflict in City Policy and conform in varying degrees with each of these objectives.

A four lane roadway (Scheme one) would not result in increased traffic on adjacent neighborhood streets and, therefore, conforms with Policy 1, Objective 1 of the Transportation Element. It would, however, maintain nonlocal travel along the length of Ocean Beach in conflict with Policy 4. The provision of two lanes in each direction does make it possible to have a slow pleasure drive without blocking faster through traffic. A four lane, curvilinear roadway is also in conformance with Supervisor's Resolution # 195-77, which calls for two lanes in each direction. The new intersections which would be introduced connecting the Great Highway with Judah, Noriega and Taraval Streets would be in conformance with Policy 31, Objective 4 of the Urban Design Element in that the motorist approaching on those connecting streets would have a view directly to the waterfront.

A two lane roadway (Scheme two) would result in the diversion of a certain amount of nonrecreational traffic which formerly used the Great Highway to residential areas in conflict with Policy 1, Objective 1 of the Transportation Element. However, because 90-95% of those now driving along the Great Highway do so for nonrecreational reasons, a large number of nonrecreational motorists could be expected to continue to use the road. Thus the experience of the pleasure driver traveling slowly along the ocean between Lincoln and Sloat would not necessarily be enhanced by the more recreational character of the

two lane road, because of traffic congestion building up behind him. Intersections connecting the Great Highway with Judah, Noriega and Taraval Streets would also be a part of a two lane plan.

If the Great Highway were closed at Skyline, nonlocal and nonrecreational traffic would be discouraged in conformance with Policy 4, Objective 1. Access would still be available for the pleasure driver in conformance with the Thoroughfares Plan. The roadway between Sloat and Lincoln could be developed as either four or two lanes; in the former case it would be in conformance with the Supervisor's Resolution. However, the nonlocal and nonrecreational traffic diverted at Skyline would still have an adverse impact upon the streets to which it shifts.

If no through traffic were permitted between Skyline and Lincoln (Scheme 3) a significant amount of additional traffic would be diverted to adjacent neighborhood streets with major impact on Sunset Boulevard and 19th Avenue. The plan would not be in conformance with either the Supervisor's resolution or Policies 1 and 2, Objective 1 of the Transportation Element. However, under this scheme the goals of the Conservation Element would be fully achieved. Although the number of pedestrian access points would not be increased, access to the beach would be improved by the elimination of the necessity for underpasses and overpasses, in conformance with the Recreation and Open Space Element. At the same time, complete separation of pedestrian and vehicle movement can be achieved in conformance with Policy 14, Objective 4 of the Urban Design Element . Scheme three is also in conformance with Policy 28, Objective 4 which states that if auto traffic and parking in parks are discouraged, recreational use can be increased.

B. CALIFORNIA COASTAL COMMISSION

The California Coastal Act of 1976 sets forth the following policies and objectives which relate to the proposed redesign of the shoreline area between Sutro Heights Park and Fort Funston.

Public Access (Sections 30210, 30211, 30212)
Maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people, consistent with public safety needs and the need to protect public rights, rights of private property owners and natural resource areas from overuse.

Recreation (Sections 30220-30223)
Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses. Development shall not preclude the use of needed public-oriented recreational and visitor serving development.

Marine Environment (Sections 30231, 30235)

Marine resources shall be maintained, enhanced, and, where feasible restored. Development shall not result in the degradation of water quality of coastal waters. Revetments, breakwaters, groins, harbor channels, seawalls, cliff-retaining walls, and other construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion or when designed to eliminate or mitigate adverse impacts on local shoreline sand supply.

Land Resources (Section 30240)

Development shall be designed to be compatible with the continuance of environmentally sensitive habitat areas located within or adjacent to it.

Development (30251, 30252)

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.

The location and amount of new development should maintain and enhance public access to the coast.

The program of beach and dune restoration recommended under all three schemes would result in a more natural beach landscape of increased aesthetic value. The maintainability of the beach and dunes would be improved over the present configuration.

The problem of beach erosion cannot ever be entirely solved by regrading and expansion of the beach. The beach stabilization program being developed by the San Francisco District of the U.S. Army Corps of Engineers for the Golden Gate National Recreation Area is therefore deemed necessary to "protect existing structures or public beaches in danger from erosion" and within the California Coastal Commission's standards for such work. It is anticipated that this program could involve construction of some form of beach protection features which would meet the visual standards of the Commission.

The Recreational Corridor proposed under all three schemes would provide additional recreational opportunities for hikers, joggers, bicyclists and equestrians. In addition, there would be increased opportunities for enjoyment of the sheltered East Park area.

Public access to the beach would be significantly improved under all three schemes with pedestrian access points proposed at thirteen locations between Lincoln and Sloat Boulevard and vehicular access at three parking areas. In addition use of bicycles as a means of access to the beach would be encouraged through the provision of bicycle trails and facilities.

At the present time three public transit lines serve the beach area - the "N" and "L" street car lines and the No. 18 bus. It is envisioned that coordination with the Municipal Railway System (Muni) and the Golden Gate National Recreation Area concerning public transit will continue and that the possibility of an "L" line extension to the Zoo or of a shuttle bus connecting the Zoo with Golden Gate Park and the Cliff House will be explored. This would be of particular importance in Scheme Three.

Scheme One responds to the expressed goals of the California Coastal Commission by its provision of visual access to the beach area to large numbers of recreational motorists. The four lane roadway configuration ensures that the sightseeing motorist would be able to enjoy the ocean view during leisurely travel without blocking the flow of traffic or inhibiting other motorists. In addition, elderly and handicapped persons would be able to closely approach the beach area by parking in the reserved parking spaces provided at the three proposed view points.

Scheme Two would provide similar opportunities for visual access to the beach area to recreational motorists. Because only one lane would be provided in each direction the roadway would appear to have a more recreational character. However, the nonrecreational motorists presently using the Upper Great Highway could be expected to continue to use it and might present a hazard to slower moving sightseers on the two lane road. This difficulty would be lessened if the road were closed at Skyline since less commute traffic would be attracted to a discontinuous route. Three vista point parking areas are also proposed under this scheme and would facilitate access to the beach area by elderly and handicapped.

Scheme Three would eliminate the possibility of a public scenic drive for motorists along Ocean Beach between Lincoln and Sloat. This would, in a sense, restrict public access to the beach area and be in conflict with one of the goals of the California Coastal Commission. There is, however, the opportunity for the development of a shuttle bus system which could run along the access road and connect the Zoo and Golden Gate Park. This would respond to the Coastal Commission's goal of increased access via public transit. This shuttle bus could be available to handicapped persons. However, the installation of a shuttle bus system would be dependent upon separate funding from either the City of San Francisco or the Golden

Gate National Recreation Area and is not part of the current redesign plan. The major advantage of this scheme is the possibility of constructing access points to the beach at-grade without interference with fast-moving traffic and thus eliminating the need for overpasses or underpasses. The number of such access points would, however, not be increased beyond those in the other schemes due to the need to protect the dune area from pedestrian encroachment. In general, a more natural beach experience would be available under this scheme and use of the recreational corridor would be enhanced by the elimination of fast-moving traffic. Thus, while access is not provided to as many groups of people, the quality of the experience enjoyed by those who wish to use the recreational corridor, a shuttle bus or to approach by foot would be improved.

C. GOLDEN GATE NATIONAL RECREATION AREA

The goals of the National Park Service for the Golden Gate National Recreation Area, as expressed in the Assessment of Alternatives published in May 1977 include the following:

Enhance public enjoyment of the natural, historic and scenic features

Provide recreational opportunities for the widest possible variety of potential users

Pursue the extension of transit service between the park and transit-dependent, low-income, high-recreation-need neighborhoods

Use transit systems to protect park resources

Develop trail system for hikers, bicyclists and equestrians

Respond to the special needs of senior citizens and the handicapped

Control erosion wherever feasible

These goals closely parallel those of the California Coastal Commission and the discussion of plan responsiveness in Section IV.B. applies equally well to the Golden Gate National Recreation Area.

The proposed beach stabilization program is being undertaken by the U.S. Army Corps of Engineers for the Golden Gate National Recreation Area and would be funded as part of its improvements. The proposed alteration to the profile of the beach under all three schemes is an essential part of the beach stabilization program and is directly responsive to the objective of the G.G.N.R.A. for control of erosion and protection and enhancement of the natural features of the park area.

V. PUBLIC PARTICIPATION

A. INFORMATION AND INVOLVEMENT PROGRAM

As part of the planning process for this redesign effort, an extensive public information and involvement program was carried out. The following activities took place:

May 17, 1977 -	Community Leaders Briefing Session
May 24, 1977 -	Introductory Public Meeting
June 6, 1977 -	Mailed 1500 brochures outlining Alternative Schemes
June 7, 1977 -	Presentation to SPUR
June 11, 1977-	Display at Golden Gate National Recreation Area Hearing
June 20, 1977-	Meeting with bicycle interest leaders
June 22, 1977-	Display at Golden Gate National Recreation Area Hearing
June 25, 1977-	Public Meeting to Explore Alternative Schemes
June 29, 1977	Public Meeting to Explore Alternative Schemes

In addition the Consultants and City staff have spend considerable time in informal meetings and conversations with community residents and representatives of the news media.

To date a total of 254 written responses or signatures have been received by the City's Wastewater Management Office. The following is a summary of favored alternatives:

Scheme	Description	No. of Responses	%
Existing	Retain existing Upper Great Highway	15	5.9%
1	Four lane parkway with redesigned recreation area	195	76.8%
2	Two lane parkway with redesigned recreation area	6	2.4%
3	No through Upper Great Highway	28	11.0%
no category	(did not pertain to alternative schemes)	10	3.9%
	TOTAL	254	100%

One of the major issues in the Great Highway Redesign Project is whether or not to maintain a roadway for unrestricted automobile traffic. From the written responses received, the public consensus favors maintaining a road, whether it be two lanes or four lanes.

The concept of a four lane curvilinear road has been endorsed by the following organizations:

Citizens Advisory Committee on Wastewater Management

Greater Geary Boulevard Merchants and Property Owners Association, Inc. (Petition with 146 signatures)

Taraval-Parkside Merchants Association, Inc.

Judah Street Merchants and Property Owners Association

Lake Merced Neighborhood Organization

Clement Street Merchant's Association

West Portal Avenue Association of San Francisco

Noriega Merchants Association

Petition of 36 signatures from the Richmond District residents, merchants, shoppers and customers

People for a Golden Gate National Recreation Area was the only organization to send a written statement favoring the no-road alternative scheme.

B. RESPONSE TO NEEDS AND DESIRES OF GENERAL PUBLIC

During the course of the public meetings which were called to discuss this project, many varying and occasionally contradictory viewpoints were expressed on the future of the Upper Great Highway and the Ocean Beach area. There appeared, however, to be a consensus that the redesign scheme should at least include the following improvements:

A program to control windblown sand

A beach stabilization program

Improvement of views to the ocean

More attractive and safer beach access

Increased number of access points

Provisions for equestrians, bicyclists, walkers and joggers

Reduction of traffic on residential streets

Undergrounding of utilities along Lower Great Highway

The dune restoration program, which forms an integral part of the design plan responds directly to the demand for a program to control windblown sand. The increased width of the dunes and the dense plantings over them will act to trap a significant percentage of the sand which presently blows across the Upper Great Highway and into the residential areas. The restored dune system will also act to reinforce the beach stabilization program being undertaken by the U.S. Army Corps of Engineers.

The lowering of the profile of the dunes and the Upper Great Highway is central to the development and maintenance of the dune system. One result of the lowered profile would be that views of the ocean from residences along the Lower Great Highway would be significantly improved. In addition, in Scheme One, the northbound lanes of the roadway would be terraced approximately 2 feet above the southbound lanes in order to improve motorists' views of the ocean.

The design plan proposes the development of eleven beach access points between Lincoln and Sloat - an increase of seven. The narrow tunnel crossings at Judah, Taraval and Wawona would be removed and new underpasses would be designed as attractive portals of less than half the length of the existing tunnels and would be sufficiently wide and high to receive natural light. Pedestrian overpasses would be located above low points in the road profile to eliminate the need for steps or excessive ramping. At-grade crosswalks would exist only at signalized intersections. Thus, the design plan responds both to the request for more attractive beach access and an increased number of access points.

All Schemes of the proposed design plan propose that a system of cul-de-sacs be developed along Lower Great Highway to restrict through traffic and that the existing overhead utility lines along the street be undergrounded, thereby responding directly to the need for such treatment as requested by the residents along Lower Great Highway.

No support was expressed at the public meetings for the suggestion that small playgrounds be developed in the East Park area. This suggestion originated with the City Concept Plan for the area but was not incorporated in our design plan due to lack of public support.

Considerable opposition was expressed to the suggestion that small parking areas could be developed on the east side of the roadway. These parking lots were, therefore, located on the west side of the roadway in response to this opposition.

Accordingly the design incorporates all of the requests for improvement on which there was a clear consensus. The alternative schemes for the design of the road were developed in response to strongly expressed but conflicting opinions. The formal response to the alternative schemes is described in the section on the INFORMATION AND INVOLVEMENT PROGRAM.

VI. CONSTRUCTION COST ANALYSIS

Construction cost figures used in the following analysis are based upon labor and material cost prevailing in June 1977. The cost of the program being developed by the Army Corps of Engineers for the protection of the beach and foredune area from wave action is not included nor is the cost of the consolidation sewer itself, the sewer outfalls, demolition of existing paving and structures or design, inspection, testing and management fees.

Figures are given in millions of dollars

SLOAT TO LINCOLN (2 miles)	4 lane curved Scheme 1	2 lane curved Scheme 2	no road curved Scheme 3	restoration straight road
1. Roadway and parking	$ 1.99	$ 1.50	$ 1.30	$ 2.08
2. Grading	.77	.65	.65	.30
3. Site utilities and lighting	1.20	1.20	1.20	.80
4. Erosion control planting and irrigation	3.50	3.70	3.80	1.80
5. Beach access for recreational users	1.90	1.50	1.40	.70
6. Equestrian trail	.52	.52	.52	.30
7. Bicycle and jogging trails	.45	.45	.45	
8. Other park and recreational improvements including walkways	1.20	.90	.90	.30
9. Lower Great Highway	.12	.12	.12	
10. Muni improvements at Judah	.16	.16	.16	
11. General Contractor's overhead, permits, bonds, supervisory personnel, markups and contingencies	1.18	1.06	1.05	.63
	$12.99	$11.76	$11.55	$ 6.91
LINCOLN TO FULTON (0.5 miles)				
1. Roadway and Parking	$ 1.10	$ .95	$ .95	$ .70
2. Grading	.08	.068	.068	.04
3. Site Utilities and Lighting	.15	.15	.15	.10
4. Erosion control planting and irrigation	.70	.70	.70	.02
5. Beach access for recreational users	1.00	.85	.85	
6. Equestrian trail	.06	.06	.06	.01
7. Bicycle and jogging trails	.08	.08	.08	.02
8. Other park and recreational improvements	.40	.40	.40	.20
9. General Contractor's overhead, permits, bonds, supervisory personnel, markups and contingencies	.36	.33	.33	.11
	$ 3.93	$ 3.59	$ 3.59	$ 1.20

Figures are given in millions of dollars

	4 lane curved Scheme 1	4 lane curved Scheme 2	4 lane curved Scheme 3	restoration straight road
Fulton to Sutro Heights Park (0.36 miles)				
1. Roadway and parking	$ .42	$ .42	$ .42	$ .40
2. Grading (elevate road above parking)	.10	.12	.12	.02
3. Site utilities and lighting	.04	.05	.05	.01
4. Erosion control planting	.11	.15	.15	.10
5. Beach access, at-grade	.03	.04	.04	.04
6. General Contractor's overhead, permits, bonds, supervisory personnel, markups and contingencies	.08	.08	.08	.07
	$ .78	$ .78	$ .78	$ .64
Sloat to Skyline (0.75 miles)				
1. Roadway and parking	$ .90	$ .75	$ .70	$ .75
2. Grading	.27	.16	.10	
3. Site utilities and lighting	.07	.07	.04	.04
4. Erosion control planting	.30	.35	.40	.20
5. Beach access (one location)	.15	.15		
6. General Contractor's overhead, permits, bonds, supervisory personnel, markups and contingencies	.17	.15	.12	.09
	$ 1.84	$ 1.63	$ 1.36	$ 1.09

SUMMARY OF TOTAL COSTS

Figures given in millions of dollars

	distance				
1. SLOAT TO LINCOLN	2.00 miles	$12.99	$11.76	$11.55	$ 6.91
2. LINCOLN TO FULTON	.50 miles	3.93	3.59	3.59	1.20
3. Fulton to Sutro	.36 miles	.78	.78	.78	.64
4. Sloat to Skyline	.75 miles	1.84	1.63	1.36	1.09
	3.61 miles	$19.54	$17.76	$17.28	$ 9.84

SQUARE FOOTAGE BASIS SUMMARY

Figures given in dollars and cents

	sq.ft.				
1. SLOAT TO LINCOLN	5,276,000	$ 2.46	$ 2.22	$ 2.19	$ 1.62*
2. LINCOLN TO FULTON	1,376,000	$ 2.86	$ 2.61	$ 2.61	$ .87
3. Fulton to Sutro	260,000	$ 3.00	$ 3.00	$ 3.00	$ 2.47
4. Sloat to Skyline	670,000	$ 2.75	$ 2.43	$ 2.03	$ 1.63

* Calculated on the basis of 4,276,000 square feet as does not include the extended beach/dune area.

VII. MAINTENANCE REQUIREMENTS AND COST ANALYSIS

The following estimate of maintenance costs is based upon 1977 prices and represents an average annual cost over the first ten years of the project life. Paved areas would not require repavement during this period. However, landscape maintenance costs would be higher during the first two years of establishment.

The beach stabilization program to protect the beach and foredune area from wave action is excluded from these costs as are recreational, cultural, educational and public safety personnel and programs. Recycled water suitable for recreational lakes and planting would be furnished by the new Wastewater Treatment Facility at no cost.

It is assumed that work would be performed in accordance with detailed maintenance specifications which set a high professional standard. It is further assumed that work programs would be efficiently managed and carried out by trained personnel and horticulturists using modern equipment including an automatic irrigation system in all landscaped areas.

	area in sq.ft.	sq.ft. cost per month	cost per month	cost per year
1. Beach: removal and clean-up of litter, mechancal raking of sand.	3,400,000	$.0024	$ 8,160	$ 97,920
2. Dune landscape: reseeding, fertilizing, litter removal, sand removal from walks.	3,800,000	$.004	$15,200	$182,400
3. East Park: lawn mowing, fertilizing, tree and shrub care, litter removal, walk sweeping	1,200,000	$.01	$12,000	$144,000
4. Golden Gate Park Expansion: lawn mowing, fertilizing, tree and shrub care, litter removal, walk sweeping	280,000	$.02	$ 5,600	$ 67,200
5. Landscape areas and walkways Fulton to Sutro Heights Park	150,000	$.012	$ 1,800	$ 21,600
6. Landscape areas: Sloat to Skyline	450,000	$.006	$ 2,700	$ 32,400
7. Recreational Corridor: sweeping asphalt, raking decomposed granite, sand and litter removal	420,000	$.005	$ 2,100	$25,200

	area in sq.ft.	sq.ft. cost per month	cost per month	cost per year
8. Road and parking areas: sweeping, sand removal, minor repairs	1,400,000	$.002	$ 2,800	$33,600
9. Restrooms, repair and maintenance	3,000	$.56	$ 1,700	$20,400
10. Site utilities and signals in project area. Does not include transport/storage line	20,000	$.08	$ 1,600	$19,200
	11,125,000	$.005	$56,960	$643,920

Among the issues to be decided prior to the establishment of a maintenance program for the Ocean Beach corridor is the jurisdictional boundary between the Golden Gate National Recreation Area and the City and County of San Francisco. At present that boundary is a straight line along the west edge of the existing Upper Great Highway between Sutro Heights Park and Sloat Boulevard. To the east of this line the Recreation and Park Department now maintains the landscaping, equestrian trail and restrooms and the Department of Public Works maintains the roadway.

Should the road be replaced with a curvilinear roadway, then the present boundaries would not be practical in terms of the future maintenance program. The following jurisdictional options exist:

1. Set a new boundary line at the west edge of the redesigned Upper Great Highway making the Golden Gate National Recreation Area responsible for all land to the west of the line and the City and County of San Francisco responsible for all land to the east of the line.

2. Have jurisdictional lines based on ease of maintaining and operating specific park and recreational areas.

   a. Sloat to Lincoln Way: All landscape and recreational areas under G.G.N.R.A. to the west of the Lower Great Highway. Under Scheme Three the road might also be under G.G.N.R.A. maintenance with the City retaining right-of-way and use for public transportation and public safety services on the curvilinear road.

   b. Lincoln Way to Fulton Street: All landscaped and road areas under the City and County of San Francisco as an extension of Golden Gate Park to the sea wall.

Under any of the three schemes, maintenance costs would rise due to the following factors:

1) an increase in landscaped park and recreational area of 54 acres
2) higher standards of maintenance
3) anticipated higher use of the expanded recreational facilities

Reductions would occur in two areas, due to the new design
1) sand removal (down 80%)
2) restroom maintenance (down 66%)

In the event the park and recreational areas were completed prior to the new sewage treatment plant, irrigation water could be obtained in the interim from either domestic sources, Golden Gate Park or from the fresh ground water which occurs along the east side of this area.

PRESENT ANNUAL MAINTENANCE COSTS

City and County of San Francisco

Recreation and Parks Department		
Sloat to Lincoln		
a. landscape	$ 82,000	
b. two restrooms	60,000	
c. sand removal	20,000	$162,000
Department of Public Works		
Sutro Heights Park to Skyline		
a. sand removal	$ 60,000	
b. general road maintenance	20,000	
c. landscape /miscellaneous	11,000	$ 91,000
National Park Service		
Cliff House to Zoo:Ocean Beach		
a. personnel	$ 80,000	
b. equipment and supplies	20,000	$100,000
		$353,000

VIII. RECOMMENDATIONS FOR REVIEW AND APPROVAL

It is the suggestion of the design team that immediate approval be obtained for the following aspects of the concept plan:

1. Curvilinear treatment of roadway or access road
2. Lowered corridor profile, including grading to create a more stable dune system
3. Planting proposed for dune system
4. East Park concept
5. Cul-de-sac treatment of Lower Great Highway
6. Undergrounding of utilities along Lower Great Highway

It is further suggested that the grading of the altered corridor profile take place while construction of the consolidation sewer is under way so as to avoid the necessity of storage of the excess sand to be generated by construction. This might necessitate the closing of the Upper Great Highway to through traffic during construction hours - possibly 9 a.m. to 4 p.m. to avoid conflict with commute hours - or the development of a two lane detour to the east of the consolidation sewer. In order to properly screen this detour from the residences on Lower Great Highway the alignment of the box culvert could be shifted to the west by 30-40 feet. This procedure would result in an earlier establishment of beach plantings and would assist in alleviating the blowing sand problem at an earlier date. It would also be necessary to avoid losing the sand before it can be placed and stabilized on the new profile.

Any of the three schemes examined could be implemented subject to sufficient public support. It would be most difficult to gain acceptance of Scheme Three - the "no road" scheme due to the large number of motorists whose accustomed routes would be diverted, the extensive off-site street modifications which would have to be developed to prohibit diverted traffic from use of residential streets and the reduction of access to the Richmond District.

The preferred alternative, from a traffic safety standpoint is the four lane scheme, which coincides with the Supervisor's recent resolution. The four lane scheme also preserves a link in the City's 49 Mile Scenic Drive and enables the elderly and handicapped to approach the central beach area. In addition, this scheme in combination with the cul-de-sacing of Lower Great Highway would result in less dispersion of through traffic into residential areas. Thus unless a majority of the public and the review agencies are found to support the "no road" scheme, we recommend the four lane curvilinear road with the expanded recreational area.

TABLE A

SUMMARY OF PARKING SERVING OCEAN BEACH ON PUBLIC LAND

		Existing Spaces	Spaces* Occupied on 5/1/77	Proposed Spaces
1.	West of Great Highway, south of Sloat Boulevard	200	59	110
2.	West of Great Highway, Sloat Boulevard to Lincoln Way	-0-	-0-	120
3.	East and West edges of Lower Great Highway	725	163	700
4.	Lincoln Way to Fulton Street	800	140	300
5.	Fulton Street to Balboa	501	not surveyed	300
		2,226		1,530

* According to a study conducted on May 1, 1977, a warm Sunday, by staff members of Alan M. Voorhees and Associates and reported on page 83 of the Environmental Impact Report, West Side Transport/Storage Project, Volume 2.

TABLE B

RECOMMENDED PLANT MATERIALS FOR DUNE AREAS

GENUS SPECIES	COMMON NAME	HABITAT*
Abronia latifolia	Yellow Sand Verbena	I, II
Abronia umbellata	Pink Sand Verbena	II, III
Achillea millefolium	White Yarrow	II, III
Ammophila arenaria	Holland Dune Grass	I, II
Ammophila breviligulata	American Dune Grass	I, II
Anaphalis margaritacea		
Armeria maritima		IV, V
Artemisia pycnocephala	Beach Sage Wort	II
Atriplex leucophylla		I
Atriplex lentiformes	Quail Bush	
Baccharis pilularis pilularis	Coyote Bush	III
Brodiaea pulchella	Blue Dicks	V
Bromus maritimus		III, IV
Castilleja wightii	Indian Paint Brush	III, IV
Castilleja latifolia		III, IV
Convolvulus soldanella	Beach Morning Glory	II, III, IV
Caktile edentula		I
Caktile maritima	Sea Rocket	I
Cardionema ramosissima		IV
Croton californicus		IV
Cryptantha intermedia	White Forget-Me-Not	V
Chenopodium californicum	California Goosefoot	IV
Conium maculatum		IV
Dudleya farinosa	Bluff Lettuce	III
Dudleya caespitosa		III
Elymus mollis	Lime Grass	I
Erigeron glaucus	Seaside Daisy	III
Eriogonum latifolium		III
Eriogonum parvifolium	Wild Buckwheat	III
Eriophyllum staechadifolium var. artemisiaefolium		III
Eschscholtzia californicus var. maritima		
Erysimum ammophilum		
Erysimum capitatum angustatum		
Erysimum concinnum		
Erysimum franciscanum	Coast Wallflower	IV
Erysimum Menziesii	Menzie's Wallflower	I, II, III

GENUS SPECIES	COMMON NAME	HABITAT*
Fragaria chiloensis	Beach Strawberry	II, III
Frankenia grandifolia		III, IV
Franseria chamissonis		III
Gnophalium chilense		III
Happlopappus ericoides	Mock Heather	III, IV
Heterotheca grandiflora		III, IV
Lathyrus littoralis	Beach Pea	I, II
Lupinus arboreus	Yellow Bush Lupine	III, V
Lupinus chamissonis	Blue Bush Lupine	III, IV
Lupinus bicolor trifidus		III, IV
Lupinus nanus		II, III, IV
Lotus scoparius	Deer Weed	III
Mesembryanthimum edule		III, IV
Mesembryanthimum chilense	Sea Fig	I
Mimulus guttatus	Monkey Flower	VI
Marah oreganus	Coast Man Root	IV
Oenothera cheiranthifolia	Beach Evening Primrose	II
Oenothera contorta		III
Oenothera Hookeri		IV
Orthocarpus purpurascens	Owls Clover	V
Phacelia ramosissima		III, IV
Plantago maritima	Sea Side Plantain	V
Poa Douglasii	Douglas Blue Grass	II, III
Salvia melliflora	Black Sage	IV
Sisyrinchium bellum	Blue Eyed Grass	V
Stellaria littoralis	Chick Weed	III, IV, V
Tanactum camphoratum		III, IV
Verbena robusta	Vervain	IV
Amsincka spectabilis		V, VI
Heliotrope curassavium oculatum		I
Arctostaphylos pumila		IV
Arctostaphylos tomentosa		IV
Archtostaphylos Pajaroensis		IV

*
I = Foredune ridge
II = Blowing sand areas
III= Sheltered or stabilized dry areas
IV = Sheltered or stabilized areas
V = Damp areas
VI = Wet depressions